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Evaluation of Select Publicly Available in Silico Methods for Predicting Functional Effects of Missense Mutations in the GALNS Gene

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**Evaluation of select publicly available in silico methods for
predicting functional effects of missense mutations in the
GALNS gene**

A thesis submitted to the faculty of
Dominican University of California and
BioMarin Pharmaceutical Inc.
in partial fulfillment of the requirements
for the degree

Master of Science
in
Biological Sciences

By
Kathryn Davidson
San Rafael, California
May 2014

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CERTIFICATION OF APPROVAL

I certify that I have read *Evaluation of select publicly available in silico methods for predicting functional effects of missense mutations in the GALNS gene* by Kathryn Davidson, and I approved this thesis to be submitted in partial fulfillment of the requirements for the degree: Master of Science in Biological Sciences at Dominican University of California and BioMarin Pharmaceutical Inc.

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ABSTRACT

The ability to sequence patient DNA has led to an explosion in the reports of mutations for a number of diseases. Frequently, published reports include in silico predictions of the probability that the mutations are disease-associated. The question asked here is how well these in silico methods predict the effects of new mutations, i.e., mutations not included in the dataset(s) used for training and testing the in silico method. To address this question, we examined mutations associated, or potentially associated, with Morquio A (MPS IVA), a rare, autosomal recessive lysosomal storage disorder (LSD) caused by a deficiency of lysosomal enzyme N-acetylgalactosamine-6-sulfatase (GALNS). In the severe form of the disease, life expectancy is less than 30 years. More than 200 unique missense mutations have been identified in the *GALNS* gene, with effects ranging from no change in function (wild-type) to significant reduction in functional effect (severe forms of the disease). Using *GALNS* as the model gene, we evaluated the ability of select publicly available in silico methods to predict the functional effects of these mutations. Specifically, the predictions of *GALNS* mutations on enzyme activity were evaluated and compared to both published and unpublished Morquio A mutations. Functional effects for unpublished Morquio A mutations were determined by measuring the enzyme activity of cells transiently transfected with mutant gene cassettes. Although some of the in silico packages perform better than others, they may not be used either individually or in combination to predict with any level of certainty whether or not any particular

mutation is deleterious. Our results strongly suggest that testing enzyme activity is still required to determine the functional impact of a specific mutation.

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ABBREVIATIONS

Abbreviation	Description
4-MU-GAL-6S	4-methylumbelliferyl-beta-D-galactose-6-sulfate
ASA	Arylsulfatase A
ASB	Arylsulfatase B
C6S	Chondroitin-6-sulfate
CHMP	Committee for Medicinal Products for Human Use
EMA	European Medicines Agency
ERT	Enzyme replacement therapy
FDA	Food and Drug Administration
FN	False negative
FP	False positive
GAG	glycosaminoglycan
GALNS	N-acetylgalactosamine-6-sulfatase Italicized indicates gene name, un-italicized indicates protein name
HEK	Human embryonic kidney cell
HGMD	Human Gene Mutation Database
kDa	kilodalton
KS	Keratan sulfate
LSD	Lysosomal storage disorder
LSDB	Locus-specific database
MCC	Matthews Correlation Coefficient
MPS	Mucopolysaccharidosis
MPS IVA	Mucopolysaccharidosis type IVA or Morquio A
NPV	Negative predictive value
PVDF	Polyvinylidene fluoride
SNP	Single nucleotide polymorphism
SVM	Support Vector Machines
TN	True negative
TP	True positive
UPD	Uniparental disomy

DEFINITIONS

Phrase	Definition
Disease associated	Mutation presented either in homozygous form or with a deletion/insertion
Likely disease associated	Mutation presented with a disease associated severe mutation
Variant of unknown significance	Mutations not meeting the criteria for disease associated or likely disease associated regardless of whether or not they have been reported as deleterious

INTRODUCTION

The central question

Literature reports of novel mutations that are potentially disease associated often include in silico predictions of the likelihood that the novel mutations are deleterious, with PolyPhen-2 and SIFT frequently being used for this purpose. In silico methods are tested on datasets prior to being released, for example, both PolyPhen-2 and SIFT were trained on HumDiv and HumVar, respectively (Adzhubei 2010 *Nat.Methods*; Sim 2012b *Nucleic Acids Res.*). The question raised here is: “How well do in silico methods perform when making predictions for mutations that were not included in their training datasets?” The *GALNS* gene was selected as the model system for testing because deleterious mutations in the gene produce Morquio A.

Morquio A background

Morquio A (mucopolysaccharidosis type IVA or MPS IVA; OMIM 253000) is due to insufficient activity of N-acetylgalactosamine-6-sulfatase or GALNS enzyme (E.C.3.1.6.4; gene symbol *GALNS*). GALNS hydrolyzes the sulfate ester groups from the non-reducing ends of keratan sulfate (KS) and chondroitin-6-sulfate (C6S), which are glycosaminoglycans (GAGs) present in proteoglycans. Reduction or loss of GALNS activity results in the accumulation of KS and C6S in lysosomes, particularly in the cartilage and cornea.

Residual GALNS activity levels are correlated with the disease severity, which ranges from mild (little bone and visceral organ involvement and lifespan

until ~60 years old) to severe (or classic, with extensive bone and corneal involvement and a lifespan of 20-30 years). Phenotypically, Morquio A is differentiated from other MPS diseases because it does not impair the individual's intelligence. Historically treatment has been palliative, however, enzyme replacement therapy (ERT) with elosulfase alfa (BioMarin Pharmaceutical Inc.) for Morquio A was approved by the Food and Drug Administration (FDA) in February 2014 and by the European Commission in April 2014.

The incidence of Morquio A is low so precise epidemiologic data are scarce. The estimated incidence varies by country from 1:76,000 in Northern Ireland (Nelson 1997 *Hum.Genet.*) to 1:625,000 in Japan (Tomatsu 2011 *Curr.Pharm.Biotechnol.*) with the variability believed to be partly due to founder effects, i.e., where a small number of individuals start a new population so any mutations in the initial group are higher in the new population relative to other populations (Tomatsu 2011 *Curr.Pharm.Biotechnol.*).

***GALNS* gene background**

The *GALNS* gene is located on chromosome 16 at position 16q24.3 (Baker 1993 *Am.J.Hum.Genet.*). The gene is approximately 50 kb and has 14 exons and 13 introns (Figure 1). The upstream region of the initiation codon is GC rich with an average GC content of 70.5%. The intron-exon organization includes interruptions even in high homology sequence regions (Nakashima 1994 *Genomics*). The wild-type gene produces a single-splice product of 1566-

bp GALNS mRNA, which codes for a 522 amino acid precursor (Tomatsu 1991 *Biochem.Biophys.Res.Commun.*).

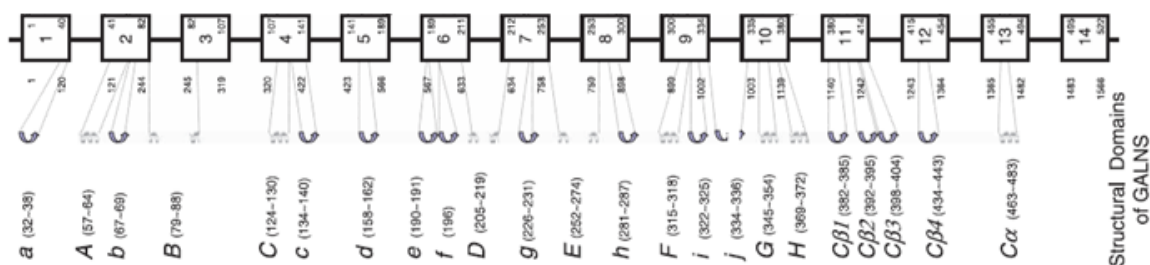


Figure 1: Human GALNS gene structure

Human *GALNS* gene has 14 exons and 13 introns.

Source: Tomatsu 2006

The disease is autosomal recessive, with both compound heterozygotes and homozygotes seen in Morquio A (Pollard 2013 *J.Inherit.Metab Dis.*). While the alleles are often inherited one from each parent, there is at least one case of uniparental disomy (UPD) documented in Morquio A (Catarzi 2012 *Mol.Genet.Metab.*).

During the time the testing and analysis for this study were being performed, a locus-specific database (LSDB) for *GALNS* did not exist. As of April 2014, a *GALNS* mutation database was under construction (<http://galns.mutdb.org/>).

GALNS enzyme background

N-acetylgalactosamine-6-sulfatase (GALNS) is a 120 kDa homodimeric glycoprotein with enzymatic activity (Masue 1991 *J.Biochem.*; Rivera-Colon 2012

J.Mol.Biol.). It is unknown whether or not the homodimerization is necessary for enzyme activity. Typical of all sulfatases, GALNS undergoes post-translational modification in the endoplasmic reticulum to convert a highly conserved cysteine residue (position 79) located within the active site into formylglycine (Dierks 1997 *Proc.Natl.Acad.Sci.U.S.A*; Rivera-Colon 2012 *J.Mol.Biol.*). This modification, catalyzed by SUMF1, is critical to its enzymatic activity (Rivera-Colon 2012 *J.Mol.Biol.*). Upon reaching the lysosome, the protein is processed into 40 kDa and 15 kDa polypeptides bridged by a disulfide bond (Masue 1991 *J.Biochem.*). While this processing does not appear to be essential, there are some questions as to whether it increases GALNS activity (Rivera-Colon 2012 *J.Mol.Biol.*).

In 2012, more than 170 unique *GALNS* mutations had been identified (Catarzi 2012 *Mol.Genet.Metab*), including missense, nonsense, small and large deletions, splice-site, insertions (Tomatsu 2005 *Hum.Mutat.*), and a large intronic deletion leading to the loss of exon 5 (Pajares 2012 *Mol.Genet.Metab*). Nine of the 10 most frequently reported mutations are single nucleotide changes (Tomatsu 2005 *Hum.Mutat.*). One study of 175 *GALNS* mutations showed that 81.8% were single nucleotide changes that resulted in a different amino acid (i.e., missense mutations) (Pollard 2013 *J.Inherit.Metab Dis.*). Missense mutations produce phenotypes ranging from wild-type to severe (Bunge 1997 *Hum.Mutat.*).

Three reasons have been proposed for how missense mutations in *GALNS* might produce a severe phenotype: 1) destruction of the hydrophobic core or other misfolding; 2) removal of a salt bridge destabilizing the entire

conformation; and 3) modification of the active site (Sukegawa 2000 *Hum.Mol.Genet.*; Rivera-Colon 2012 *J.Mol.Biol.*). Ninety percent of mutations that destroy the core or folding, remove the salt bridge or modify the active site in GALNS are associated with the severe phenotype. In contrast, only approximately 30% of documented surface protein mutations produce a severe phenotype (Rivera-Colon 2012 *J.Mol.Biol.*).

The GALNS enzyme structure was first determined in 2012 (Rivera-Colon 2012 *J.Mol.Biol.*) (Figure 2). GALNS has three domains: 1) N-terminal domain containing the active site (by far the largest of the 3 domains), 2) antiparallel beta-strands and 3) C-terminal meander which loops back into domain 1 and defines a portion of the active site (this last domain is a novel conformation). Domain 1 is highly conserved while domain 2 is only slightly conserved and domain 3 (C-terminal meander) is not conserved across species (Rivera-Colon 2012 *J.Mol.Biol.*).

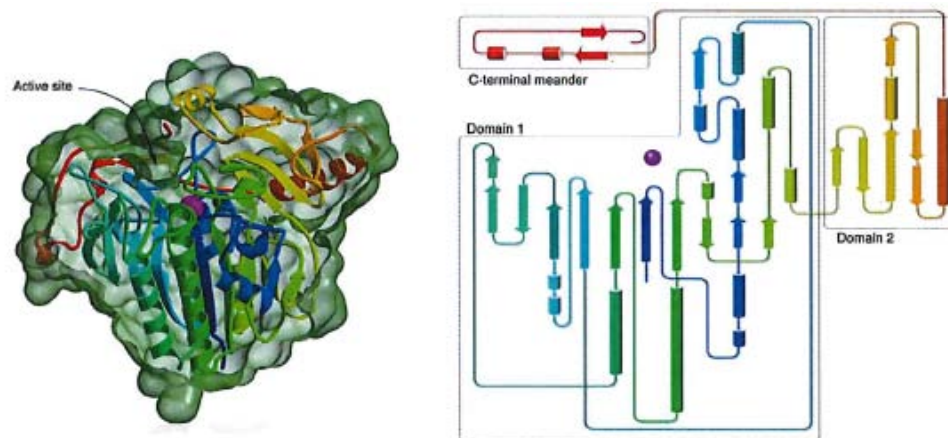


Figure 2: Human GALNS enzyme monomer structure and domains

GALNS has three domains, with the C-terminal forming part of the active site.
Source: (Rivera-Colon 2012 *J.Mol.Biol.*)

Of the 120 disease-causing missense mutations mapped on the GALNS enzyme, four (3%) affected the signal sequence, six (5%) affected active-site residues, 78 (65%) mapped to residues buried within the protein core and 32 (27%) mapped to surface residues. Domain 1 contains a larger number of mutations that map to buried residues (68) versus surface residues (19), while domain 2 mutations are nearly equally distributed between buried (9) and surface (10) residues (Rivera-Colon 2012 *J.Mol.Biol.*). Many diseases are hypothesized to be caused by improper protein folding which affects protein structure (Thomas 1995 *Trends Biochem.Sci.*), including Morquio A, and the higher proportion of mutations found within the interior of the GALNS protein are consistent with this hypothesis (Rivera-Colon 2012 *J.Mol.Biol.*).

Prior to the elucidation of the GALNS structure in 2012 by Rivera-Colon, studies and algorithms used homology modeling based on the 2 best known paralogs: 36% identical human arylsulfatase A (ASA) and 28% identical arylsulfatase B (ASB) sequences (Rivera-Colon 2012 *J.Mol.Biol.*). In silico methods that leverage homology modeling will benefit from using the newly elucidated GALNS structure because the similarity between homologs is less than 50%.

In silico methods background

In silico methods have been developed in an effort to understand the impact of mutations on protein function with the hope of using the knowledge to predict the effect of mutations. In silico methods evaluate factors important to

protein function, including but not limited to, sequence similarity and homology, amino similarity, change in free energy ($\Delta\Delta G$), secondary structure, solvent accessibility, polarity, side chain volume, and surface area accessibility.

Algorithms used to evaluate factors important to protein function and make a prediction regarding functional effect fall into one of three categories:

1) independently created, 2) based on the Bayesian rule or 3) Support Vector Machines (SVM) based. Independently created algorithms are algorithms that are not based on previously published rules or models.

Algorithms based on the Bayesian rule follow the logic set forth by Thomas Bayes in 1764 which states that it is possible to calculate the impact that event B has on event A using probability. The most simplistic example of this would be to calculate the probability that a mutation is deleterious based on whether the amino acid is in the same group with similar characteristics. For example, the second amino acid in GALNS is alanine (nonpolar). Event A is the probability that a nucleotide change in the second codon results in a missense mutation. The second nucleotide is a C, which if changed to A gives glutamate (acidic), G gives glycine (nonpolar) and T gives valine (nonpolar). This means that all three nucleotide changes produce a missense mutation. Event B is the probability that the missense mutation results in a different amino acid group type. Two of the nucleotide changes result in nonpolar amino acids similar to alanine while one produces an acidic amino acid. In other words, there is a one in three chance that the amino acid group type will be changed. Assuming that amino acid changes resulting in different group types are deleterious, the probability

that a nucleotide change of the second codon on the second alanine in GALNS will result in a deleterious mutation is $\frac{3}{3} \times \frac{1}{3} \times 100$, or 33%.

Support Vector Machines (SVMs) categorize and estimate relationships among variables based on “learning algorithms” which must be trained on examples labeled as being in one of two categories. The algorithm then learns from these examples by generating a model which it can use to separate unknown items into those same two categories. This model depends on pattern recognition rather than the calculations of probability used by Bayesian rule algorithms.

Analysis methods background

Predications about whether a missense mutation is deleterious can be scored in one of four possible ways: 1) true positive (tp, correctly predicted to be deleterious), 2) true negative (tn, correctly predicted to be neutral), 3) false positive (fp, incorrectly predicted to be deleterious) or 4) false negative (fn, incorrectly predicted to be neutral).

The true negative, true positive, false negative and false positive values fit into a 2x2 contingency table. An example using the Condel results for both datasets is provided in Table 1.

Table 1: Example prediction results displayed in a 2x2 contingency table

Condel 1996-2010	Condition Positive	Condition Negative	Condel 2012-2014	Condition Positive	Condition Negative
Predicted Outcome Positive	True positive (deleterious) 57/92	False positive (Type I error) 0/10	Predicted Outcome Positive	True positive (deleterious) 21/26	False positive (Type I error) 0/10
Predicted Outcome Negative	False negative (Type II error) 35/92	True negative (neutral) 10/10	Predicted Outcome Negative	False negative (Type II error) 5/26	True negative (neutral) 10/10

Green represents correctly predicted results while red represents incorrectly predicted results (errors).

This 2x2 contingency table can be used to perform six different analysis measurements: sensitivity, specificity, precision, negative predictive value (NPV), accuracy and Matthews Correlation Coefficient (MCC) (Table 2).

Table 2: Six analysis methods context

	Condition Positive	Condition Negative	Measurements	
Predicted Outcome Positive	True positive (deleterious)	False positive (Type I error)	Precision (aka Positive predictive value, PPV)	$\frac{\Sigma \text{ True positive}}{\Sigma \text{ Predictedoutcome positive}}$
Predicted Outcome Negative	False negative (Type II error)	True negative (neutral)	Negative predictive value (NPV)	$\frac{\Sigma \text{ True negative}}{\Sigma \text{ Predictedoutcomenegative}}$
Measurements	Sensitivity (aka true positive rate, TPR)	Specificity (aka true negative rate, TNR)	<ul style="list-style-type: none"> • Accuracy • Matthews Correlation Coefficient (MCC) These measurements use all components of the 2x2 contingency table	
	$\frac{\Sigma \text{ True positive}}{\Sigma \text{ Conditionpositive}}$	$\frac{\Sigma \text{ True negative}}{\Sigma \text{ Conditionnegative}}$		

Green represents correctly predicted results while red represents incorrectly predicted results (errors).

Each of the measurements evaluates either a subset of the 2x2 contingency table (sensitivity, specificity, precision and NPV) or the entire

contingency table (accuracy and MCC) (Vihinen 2012 *BMC.Genomics*).

Formulas for all six measurements are provided in Figure 3.

$$\text{Sensitivity} = \frac{tp}{tp + fn}$$

$$\text{Specificity} = \frac{tn}{fp + tn}$$

$$\text{Precision} = \frac{tp}{tp + fp}$$

$$\text{Negative Predictive Value (NPV)} = \frac{tn}{tn + fn}$$

$$\text{Accuracy} = \frac{tp + tn}{tp + tn + fp + fn}$$

Matthews Correlation Coefficient (MCC)

$$= \frac{tp \times tn - fn \times fp}{\sqrt{(tp + fn)(tp + fp)(tn + fn)(tn + fp)}}, \text{ which can be summarized as } \sqrt{\frac{\chi^2}{N}}$$

where $\chi^2 = \sum \frac{(fo-fe)^2}{fe}$, fo = frequency observed, and fe = frequency expected

Figure 3: Formulas for statistical calculations

Six measurements evaluate the performance of in silico method predictions based on predictive results falling into one of four categories: true positive (tp), true negative (tn), false positive (fp) or false negative (fn). Four formulas evaluate a subset of these categories (sensitivity, specificity, precision and NPV) and two formulas evaluate all four simultaneously (accuracy and MCC).

Sensitivity and specificity determine how many mutations the in silico methods correctly predicted were deleterious or neutral, respectively. Precision (or positive predictive value, PPV) and Negative Predictive Value (NPV) determine how many mutations the in silico methods said were deleterious or neutral were actually deleterious or neutral, respectively. Accuracy measures how close the prediction of deleterious or neutral are to the actual effect for all

mutations. The MCC (aka Φ coefficient) is the equivalent of a χ^2 statistical test for a 2x2 contingency table. MCC is used to measure the association between the predictions and the conditions and, as with other correlation coefficients, calculate the likelihood that the results can be explained by chance (Chedzoy 2006 Encyclopedia of Statistical Sciences). MCC results in a value between -1 (inverse correlation between predicted and actual) and +1 (perfect prediction) with 0 being no better than random chance, while sensitivity, specificity, precision, NPV and accuracy results are percentages (Vihinen 2012 *BMC.Genomics*).

Precision and NPV are susceptible to differences in size between the number of deleterious and neutral mutations while the other four measurements are not. Precision is inversely correlated to the ratio of deleterious mutations while NPV is directly correlated (Vihinen 2012 *BMC.Genomics*). If different datasets are used to test different in silico methods, then the results must be normalized so the ratio of deleterious mutations is comparable for all in silico methods in order to be able to meaningfully use precision and NPV.

All six measurements are recommended if an objective, quantitative comparison of overall in silico methods performance is desired as no one measurement encompasses all the assessments performed by the six measurements (Vihinen 2012 *BMC.Genomics*).

Previous in silico methods evaluations

In 2011, Thusberg et al evaluated nine in silico methods (MutPred, nsSNPAnalyzer, PANTHER, PhD-SNP, PolyPhen-1 and 2, SIFT, SNAP and

SNPs&GO) on a dataset with neutral mutations from one source (dbSNP, <http://www.ncbi.nlm.nih.gov/SNP/>) and deleterious mutations derived from three different sources: 1) PhenCode database (<http://www.bx.psu.edu/phencode>), 2) IDbases registries (<http://structure.bmc.lu.se/idbase/>) and 3) 18 locus-specific databases (LSDBs). Since there was no one single dataset used by all in silico methods, the results from each method had to be normalized for comparison analysis in the study. SNPs&GO performed best in four of the measurements (specificity, precision, accuracy and MCC) while SNAP and MutPred each performed best on one measurement (sensitivity and NPV, respectively). While it was concluded that SNPs&GO and MutPred performed best based on accuracy and MCC scores, Thusberg et al noted that further development was necessary since no one method ranked the highest in all six measurements.

MATERIALS AND METHODS

In silico methods selection

An advanced search was performed on Entrez PMC (<http://www.ncbi.nlm.nih.gov/pmc/>) with “All Fields” values of “method, predict, missense” and “Electronic Publish Date” values of “2010/01/01 to present” (which was December 2012). Results were manually reviewed to identify in silico methods meeting the following criteria: 1) publically available, web-based in silico methods that does not require any installation and/or coding, 2) able to make predictions on unreported mutations and 3) capable of batch analysis.

Mutation dataset creation

RefSeqGene (<https://www.ncbi.nlm.nih.gov/refseq/rsg/>) reference sequences NP_000503.1 (protein) and NM_000512.4 (cDNA) were used for dataset generation and testing. A dataset of all possible *GALNS* missense mutations was manually generated using MS Excel (dataset available in semicolon delimited format in Appendix 1).

In silico methods prediction generation

In silico methods predications were generated between March and September 2013 using the protein mutation dataset and NM_000512.4 as the cDNA reference. Some in silico methods required different delimited formats which were generated from the protein mutation dataset using Find/Replace in MS Word. If an in silico method had options that could be set to default, the default values/settings were used. FATHMM was run with the prediction algorithm set at “unweighted” and the phenotypic association set to “human phenotype ontology” because using “weighted” and “disease ontology”, respectively, assessed everything as damaging. MuStab was run with the pH condition set to 7.0 and temperature of 37°C. Mutation Assessor was run with the following items selected: mapping issue, position/residue in Refseq/Uniprot proteins and binding sites. PMut was run with the setting “Exhaustive mutation of all the positions”. PolyPhen-2 was run with the Classifier model of “HumDiv”, Genome assembly of “GRCh37/hg19”, transcripts of “Canonical” and Annotations

as “Missense”. SNAP was run with a minimum reliability index set to 0 and minimum expected accuracy set to greater than 50%.

Nomenclature from the returned results was standardized to values of “Deleterious” and “Neutral” (Table 3). Four in silico methods could not return results for all of the mutations queried; when predictions were not returned for a mutation, results were standardized to “N/A” and treated as “Neutral” for purposes of the analysis. Full testing results are provided in Appendix 2.

Table 3: In silico methods nomenclature standardization

In silico methods	Deleterious	Neutral	No Prediction Made (Not Available or N/A)
Condel	Deleterious	Neutral	Mutation not included in results list
FATHMM	Damaging	Tolerated	Predictions made for all mutations
MuStab	Decreased	Increased	Mutation not included in results list
Mutation Assessor	Low, Medium or High	Neutral	“AA variant” and “Functional Impact” columns left blank
MutPred	RFscore ≥ 0.5	RFscore < 0.5	Predictions made for all mutations
nsSNPAnalyzer	Disease	Neutral	Predictions made for all mutations
PANTHER	Pdeleterious ≥ 0.5	Pdeleterious < 0.5	No value returned and message saying “position does not align to the HMM”
PMut	Pathological	Neutral	Predictions made for all mutations
PolyPhen-2	Possibly damaging or probably damaging	Benign	Predictions made for all mutations
PROVEAN	Deleterious	Neutral	Predictions made for all mutations
SIFT	Damaging	Tolerated	Predictions made for all mutations
SNAP	Non-neutral	Neutral	Predictions made for all mutations

Reported mutations collection and verification

Reported mutations were collected by several methods: 1) searching dbSNP (<http://www.ncbi.nlm.nih.gov/SNP/>), 2) Exome Variant Server (<http://evs.gs.washington.edu/EVS/>), 3) searching Entrez PMC (<http://www.ncbi.nlm.nih.gov/pmc/>) and 4) reviewing the reference sections of relevant publications discovered through Entrez PMC. Original published reports

were obtained whenever possible. Reported nucleotide and protein changes were confirmed by manually checking against cDNA sequence NM_000512.4 to verify that each reported nucleotide change would produce the reported amino acid change. Clarification was sought for all identified errors by checking published information and/or author correspondence.

Mutations were manually categorized as 1) neutral, 2) deleterious or 3) variant of unknown significance. Mutations were categorized as neutral when the mutation exhibited wild-type activity levels or a normal phenotype. Mutations were categorized as deleterious when the mutation was classified as “disease associated” or “likely disease associated”. For this study, mutations were classified as “disease associated” when the mutation presented in patients in homozygous form or when the mutation was one allele and the second allele was any insertion or deletion. Mutations were identified as “likely disease associated” when the mutation presented in patients with a known severe mutation and enzyme activity was less than wild-type. Known severe mutations were required for the second allele because mild mutations produce enough enzyme activity that it is not possible to determine the effect of the unknown mutation unless it produced very high activity levels, i.e., mild mutations can mask the lack of activity in a second allele. Mutations that could not be categorized as neutral or deleterious (according to the definition used in this study above) were categorized as “variants of unknown significance” even if the mutation was reported as deleterious, and were not included in the datasets.

Enzymatic activity testing

Mutations were selected for enzyme activity testing based on one of three criteria: 1) mutations that were likely disease associated and in silico methods predictions were either split or in total agreement with each other that it was neutral or deleterious, 2) mutations that were variants of unknown significance and in silico methods predictions were in agreement, or 3) mutations that might impact dimerization and potentially activity.

Site-directed mutagenesis and enzymatic activity testing were performed by HD BioSciences (Shanghai, China). Mutagenesis was performed according to manufacturer's instructions using the QuikChange II XL kit (Agilent, Santa Clara CA). The primers used for site-directed mutagenesis are listed in Table 4.

Table 4: Primers used for enzyme assay mutations

Base mutation site	AA mutation site	F / R	Primer sequence(5'--3')
c.79G>A	A27T	F	ATG GGG GCC TCG GGC ACC CCG CAG CCC CCC AAC
		R	GTT GGG GGG CTG CGG GGT GCC CGA GGC CCC CAT
c.121A>T	M41L	F	CTG CTC ATG GAC GAC TTG GGA TGG GGT GAC
		R	GTC ACC CCA TCC CAA GTC GTC CAT GAG CAG
c.125G>A	G42E	F	TCA TGG ACG ACA TGG AAT GGG GTG ACC TCG
		R	CGA GGT CAC CCC ATT CCA TGT CGT CCA TGA
c.139G>A	G47R	F	GGATGGGGTGACCTCAGGGTGTATGGAGAGC
		R	GCTCTCCATACACCCTGAGGTCACCCCATCC
c.149G>T	G50V	F	ACC TCG GGG TGT ATG TAG AGC CCT CCA GAG
		R	CTC TGG AGG GCT CTA CAT ACA CCC CGA GGT
c.280C>T	R94C	F	GGA CGG CTA CCC ATC TGC AAT GGC TTC TAC
		R	GTA GAA GCC ATT GCA GAT GGG TAG CCG TCC
c.289T>G	F97V	F	ATC CGC AAT GGC GTC TAC ACC ACC AAC
		R	GTT GGT GGT GTA GAC GCC ATT GCG GAT GGG
c.332A>G	Q111R	F	ACGCCTACACACCGCGGGAGATTGTGGGCGG
		R	CCGCCACAATCTCCGCGGTGTGTAGGCGT
c.337A>T	I113F	F	TAC ACA CCG CAG GAG TTT GTG GGC GGC ATC CCA
		R	GGT GAT GCC GCC CAC AAA CTC CTG CGG TGT GTA

Base mutation site	AA mutation site	F / R	Primer sequence(5'--3')
c.347G>T	G116V	F	AGG AGA TTG TGG GCG TCA TCC CAG ACT CGG
		R	CCG AGT CTG GGA TGA CGC CCA CAA TCT CCT
c.363G>C	E121D	F	CATCCAGACTCGGAC CAGCTCCTGCCGGAG
		R	CTCCGGCAGGAGCTGTGCCGAGTCTGGGATG
c.374C>T	P125L	F	CGGAGCAGCTCCTGCTGGAGCTTCTGAAGAA
		R	TTCTTCAGAAGCTCCAGCAGGAGCTGCTCCG
c.415G>A	G139S	F	GTC AGC AAG ATT GTC AGC AAG TGG CAT CTG
		R	CAG ATG CCA CTT GCT GAC AAT CTT GCT GAC
c.463G>A	G155R	F	CACCCCTGAAGCACAGATTTGATGAGTGGT
		R	ACCACTCATCAAATCTGTGCTTCAGGGGGTG
c.491A>C	N164T	F	GGT TTG GAT CCC CCA CCT GCC ACT TTG GAC
		R	GTC CAA AGT GGC AGG TGG GGG ATC CAA ACC
c.499T>G	F167V	F	TCC CCC AAC TGC CAC GTT GGA CCT TAT GAC AAC
		R	GTT GTC ATA AGG TCC AAC GTG GCA GTT GGG GGA
c.532A>G	I178V	F	AAG GCC AGG CCC AAC GTC CCT GTG TAC AGG
		R	CCT GTA CAC AGG GAC GTT GGG CCT GGC CTT
c.599C>T	T200M	F	CTA TTA ATC TGA AGA TGG GGG AAG CCA ACC
		R	GGT TGG CTT CCC CCA TCT TCA GAT TAA TAG
c.608C>T	A203V	F	TGA AGA CGG GGG AAG TCA ACC TCA CCC AGA
		R	TCT GGG TGA GGT TGA CTT CCC CCG TCT TCA
c.612C>G	N204K	F	GACGGGGGAAGCCAA GCTCACCCAGATCTAC
		R	GTAGATCTGGGTGAGCTTGGCTTCCCCCGTC
c.685T>C	Y229H	F	CAC CCC TTT TTC CTC CAC TGG GCT GTC GAC GCC
		R	GGC GTC GAC AGC CCA GTG GAG GAA AAA GGG GTG
c.692C>G	A231G	F	TTT TTC CTC TAC TGG GTG GTC GAC GCC ACG CAC
		R	GTG CGT GGC GTC GAC ACC CCA GTA GAG GAA AAA
c.761A>G	Y254C	F	GTCAGCGAGGGCGGTGTGGAGACGCCGTC
		R	CGGACGGCGTCTCCAACCCGCCCTCGCTGAC
c.776G>A	R259Q	F	ATG GAG ACG CCG TCC AGG AGA TTG ATG ACA
		R	TGT CAT CAA TCT CCT GGA CGG CGT CTC CAT
c.850T>G	F284V	F	GAC AAC ACC TTC GTC GTC TTC ACG TCG GAC AAC
		R	GTT GTC CGA CGT GAA GAC GAC GAA GGT GTT GTC
c.868G>A	G290S	F	TTC ACG TCG GAC AAC AGC GCT GCC CTC ATT
		R	AAT GAG GGC AGC GCT GTT GTC CGA CGT GAA
c.935C>G	T312S	F	TGT GTG GGA AGC AGA GCA CGT TTG AAG GAG
		R	CTC CTT CAA ACG TGC TCT GCT TCC CAC ACA
c.1127G>A	R376Q	F	CTC CTG CAG GGC CAG CTG ATG GAC AGG CCT
		R	CCT GTC CAT CAG CTG GCC CTG CAG GAG GGT
c.1138A>G	R380G	F	GGC CGG CTG ATG GAC GGG CCT ATC TTC TAT
		R	ATA GAA GAT AGG CCC GTC CAT CAG CCG GCC
c.1156C>T	R386C	F	GCCTATCTTCTATTACTGTGGCGACACGCTG
		R	CAGCGTGTCCGACAGTAATAGAAGATAGGC
c.1171A>G	M391V	F	CGTGGCGACACGCTGTGGCGGCCACCCTCG

Base mutation site	AA mutation site	F / R	Primer sequence(5'--3')
		R	CGAGGGTGGCCGCCA C CAGCGTGTCCGCCACG
c.1177G>T	A393S	F	GAC ACG CTG ATG GCG T CC ACC CTC GGG CAG CAC
		R	GTG CTG CCC GAG GGT G A CGC CAT CAG CGT GTC
c.1183C>G	L395V	F	CTG ATG GCG GCC ACC G TC GGG CAG CAC AAG
		R	CTT GTG CTG CCC GAC C GGT GGC CGC CAT CAG
c.1192C>G	H398D	F	GCCACCCTCGGGCAG G ACAAGGCTCACTTCT
		R	AGAAGTGAGCCTTGT C CTGCCCGAGGGTGGC
c.1219A>C	N407H	F	TTCTGGACCTGGACC C ACTCCTGGGAGAACT
		R	AGTTCTCCAGGAGT G GGTCCAGGTCCAGAA
c.1262G>A	G421E	F	TTG ATT TCT GCC CTG A GC AGA ACG TTT CAG
		R	CTG AAA CGT TCT G CT CAG GGC AGA AAT CAA
c.1269C>G	N423K	F	CTG CCC TGG GCA GAA G GT TTC AGG GGT CAC
		R	GTG ACC CCT GAA ACC C TTC TGC CCA GGG CAG
c.1354T>A	F452I	F	GAC CCA GGG GAG AGG A TC CCC CTC AGC TTT
		R	AAA GCT GAG GGG GAT T CCT CTC CCC TGG GTC
c.1376C>T	A459V	F	CTC AGC TTT GCC AGC G TC GAG TAC CAG GAG GCC
		R	GGC CTC CTG GTA CTC G AC GCT GGC AAA GCT GAG
c.1438G>T	V480F	F	CAC CAG GAG GCC TTG T TC CCC GCG CAG CCC CAG
		R	CTG GGG CTG CGC GGG GAA A CAA GGC CTC CTG GTG
c.1462G>A	V488M	F	CAG CCC CAG CTC AAC A TG TGC AAC TGG GCG GTC
		R	GAC CGC CCA GTT GCA CAT T GTT GAG CTG GGG CTG
c.1480A>G	M494V	F	TGCAACTGGGCGGT C GTAAGTGGGCACCTC
		R	GAGGTGCCAGTTCA C GACCGCCAGTTGCA

Following mutagenesis, each mutation was confirmed by fluorescence-based automated chain-termination DNA sequencing performed by Invitrogen, Shanghai China. Wild-type and mutant *GALNS* gene cassettes housed in the expression vector (pCEP4, Life Technologies, Grand Island NY), were transiently co-transfected with equal parts of a pCEP4 plasmid containing SUMF1 (0.5 μ g each, required to post-translationally modify GALNS into the active form) into human embryonic kidney cells (HEK293, ATCC, Manassas VA) using

lipofectamine (Life Technologies, Grand Island NY). Cells with and without pCEP4 (sans *GALNS*) were grown concurrently to serve as controls.

The activity assay was a modified version of a *GALNS* antibody capture assay developed by Rajeev Mahimkar (BioMarin, unpublished). Forty-eight to 72 hours post transfection, HEK293 cells transfected with *GALNS* expression plasmids were washed and then lysed in lysis buffer (Sigma-Aldrich, St Louis MO). Anti-*GALNS* mouse monoclonal antibodies at 10, 20 or 30 mg/mL (BioMarin, Novato CA) or anti-*GALNS* rabbit polyclonal antibodies at 1, 5 or 10 mg/mL (BioMarin, Novato CA) in 100 mL PBS (2.7 mM KCl, 1.8 mM KH₂PO₄, 137 mM NaCl, 10 mM Na₂HPO₄, pH 7.4) were used to coat 96 well plates by overnight incubation at 4°C. The next day, the antibody-coated wells were washed with reaction buffer (19.5 mM acetic acid, 5.5 mM sodium acetate, 1 mM NaCl, 0.2% Tween 20, 0.01% sodium azide, pH 4.0), blocked for 10 minutes at room temperature with blocking buffer (reaction buffer plus 1% BSA), and incubated with cell lysates for 2 hours at 37°C.

Enzyme activity was determined using a fluorogenic coupled enzyme activity assay (Figure 4). First, 5 mM 4-methylumbelliferyl- β -D-galactose-6-sulfate (4-MU-GAL-6S, Sigma-Aldrich) in reaction buffer at pH 4.0 is added to the wells for 30 minutes at 37°C, and then 50 μ L of 5 μ g/mL β -galactosidase (Sigma-Aldrich) at pH 7.2 is added at 37°C for 15 minutes. The reaction was stopped by adding 100 μ L of glycine/carbonate buffer (356 mM glycine, 444 mM sodium carbonate, pH 9.5) per well and the results read using a fluorescent microplate reader (EnVision® Multilabel Reader, Perkin Elmer, Waltham MA) at

excitation and emission wavelengths of 355nm and 460nm, respectively. Results were normalized against the wild-type expression for each run. At least three different transfection batches were assayed to ensure results were reproducible.

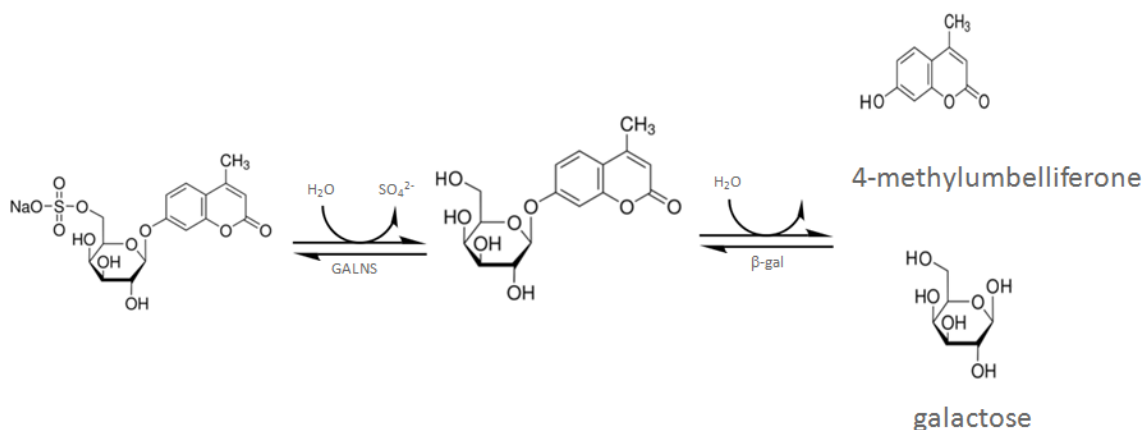


Figure 4: Coupled enzyme activity assay

The enzyme activity assay is coupled, with 4-methylumbelliferyl-β-D-galactose-6-sulfate processed first by GALNS and then by β-galactosidase to produce the fluorescent 4-methylumbelliferone.

HEK293/GALNS cell lysate (5 μg) was also analyzed by Western blot.

Expression of GALNS was detected using polyclonal GALNS antibody (1:5,000) (BioMarin) and a secondary anti-rabbit IgG conjugated to horseradish peroxidase (1:5,000) (Santa Cruz Biotechnology, Santa Cruz CA). Blots were developed using Amersham ECL according to manufacturer's protocol (GE Healthcare Life Sciences, Pittsburgh PA).

It has not been empirically determined what quantity of GALNS activity is required to produce a normal phenotype, however, it is known that family members who have only one copy of a deleterious mutation combined with a wild-type allele produce a wild-type phenotype while other family members with a

deleterious mutation in either homozygous or compound heterozygous form will have a disease associated phenotype (Cole 1996 *Am.J.Med.Genet.*; Tylki-Szymanska 1998 *Clin.Genet.*), which means that 50% activity level is high enough to produce a “wild-type” phenotype. Thus, this study defined 50% of wild-type or greater as being within the wild-type activity range.

In silico methods evaluation

In silico methods predictions were analyzed with MS Excel using the formulas for sensitivity, specificity, precision, negative predictive value (NPV), accuracy and Matthews Correlation Coefficient (MCC) provided in Figure 3 (Vihinen 2012 *BMC.Genomics*).

Two combinations of in silico methods were also evaluated. The first combination were the three methods based on relative ranking for both datasets that had the highest number of top rankings and tightest spreads (Condel, MutPred and nsSNPAnalyzer), where all three methods had to be unanimous before a mutation was considered deleterious (called Top 3). The second combination was all 12 methods, where at least two-thirds (i.e., eight out of 12) had to agree before a mutation was considered deleterious (called All 12).

RESULTS

Evaluation approach

Analysis involved mutation collation, enzyme activity testing and in silico methods testing. Mutation collation was comprised of reviewing published information for reported mutations. Enzyme activity testing involved assessing activity levels for both reported and unreported mutations using a fluorogenic substrate. In silico methods testing used datasets comprised of reported mutations and unreported mutations with experimentally derived enzyme activity levels. Mutations were categorized as disease associated, likely disease associated, variants of unknown significance or neutral. A graphical representation of the events is provided in Figure 5.

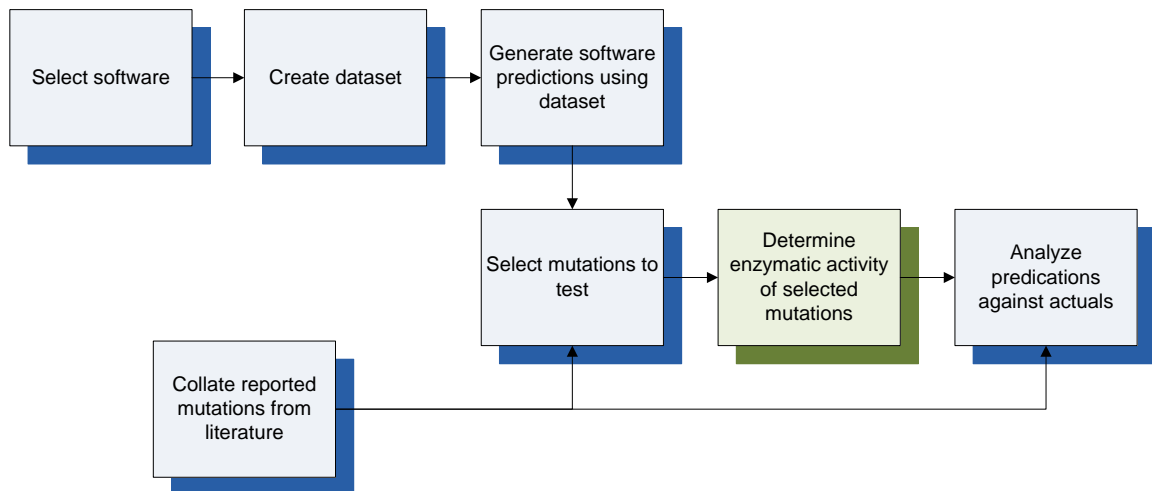


Figure 5: Overview of testing approach

The testing approach involved in determining the predictions for missense mutations in selected using in silico methods and evaluated against actual phenotypes as determined by either literature reports or enzyme activity assay. Blue indicates work performed by Kathryn Davidson, green indicates work performed by HD Biosciences.

Dataset creation results

A total of 236 missense mutations were identified from searches of dbSNP, Exome Variant Server, published literature and based on enzyme activity results from this study. One hundred eight mutations were classified as “variants of unknown significance” and not included in the final datasets because their disease association is not known, therefore, they cannot be categorized as deleterious or neutral.

The remaining 128 mutations were included in the datasets: 118 deleterious (either disease associated or likely disease associated) and ten neutral mutations. A complete list of the 128 mutations, the categorization of each mutation, and its first reference is provided in Table 5.

Of the ten neutral mutations, eight had been reported as neutral (L67M, I178V, T200M, A231G, A393S, A459V, and V488M), one (L395V) had been reported as deleterious (Yamada 1998 *Hum.Mutat.*), and two (N423K and V480F) were not previously reported. L395V was included in the neutral dataset despite being previously reported as deleterious based on our enzyme activity showing wild-type activity levels of 85.57%. N423K and V480F were included in the neutral dataset based on our testing showed enzyme activity levels above 50% (51.41% and 90.93%, respectively).

Table 5: GALNS mutations used in datasets

cDNA Mutation	Protein Mutation	Disease Associated or Neutral	Likely Disease Associated or Likely Neutral	Rivera-Colon Mutation Category	First Referenced
c.1A>G	M1V	Severe		Processing	(Tomatsu 2004a <i>Hum.Mutat.</i>)
c.3G>A	M1I				(Dung 2013 <i>Mol.Genet.Metab</i>)
c.43C>A	L15M				(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.47T>A	V16E				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.67G>C	G23R				(Tomatsu 2004b <i>Hum.Mutat.</i>)
c.79G>A	A27T		Likely disease associated*		dbSNP
c.94A>G	N32D	Intermediate			(Ye 2013 <i>Zhonghua Er.Ke.Za Zhi.</i>)
c.107T>C	L36P	Mild		Buried	(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.107T>G	L36R				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.118G>A	D40N				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.121A>T	M41L	Mild		Buried	(Tomatsu 2004 <i>J.Med.Genet.</i>)
c.122T>A	M41K	Severe		Buried	(Dung 2013 <i>Mol.Genet.Metab</i>)
c.125G>A	G42E		Severe	Buried	(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.139G>A	G47R	Severe		Buried	(Bunge 1997 <i>Hum.Mutat.</i>)
C.143T>C	V48A				dbSNP
c.143T>G	V48G				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.149G>T	G50V		Likely disease associated*		This study
c.151G>A	E51K				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.158C>T	S53F				(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.170C>T	P57L				dbSNP, Exome Variant Server
c.178G>A	D60N	Mild		Surface	(Bunge 1997 <i>Hum.Mutat.</i>)
c.180C>A	D60E				(Ye 2013 <i>Zhonghua Er.Ke.Za Zhi.</i>)

cDNA Mutation	Protein Mutation	Disease Associated or Neutral	Likely Disease Associated or Likely Neutral	Rivera-Colon Mutation Category	First Referenced
c.181C>T	R61W	Mild		Surface	(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.196G>A	G66R	Severe		Buried	(Laradi 2006 <i>Mol.Genet.Metab</i>)
c.199C>A	L67M	Neutral			(Bunge 1997 <i>Hum.Mutat.</i>)
c.205T>G	F69V		Severe	Buried	(Kato 1997 <i>Hum.Genet.</i>)
c.218A>G	Y73C				(Lee 2012 <i>Korean J.Pediatr.</i>)
c.221C>T	S74F	Mild			(Pajares 2012 <i>Mol.Genet.Metab</i>)
c.224C>G	A75G	Severe			(Tomatsu 2004 <i>J Hum.Genet.</i>)
C.229C>G	P77A			Buried	dbSNP
c.230C>G	P77R	Severe		Buried	(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.236G>A	C79Y	Severe		Active site	(Tomatsu 2004 <i>J Hum.Genet.</i>)
c.238T>A	S80T				Exome Variant Server
c.239C>T	S80L				(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.242C>T	P81L				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.244T>C	S82P	Mild			(Dung 2013 <i>Mol.Genet.Metab</i>)
c.245C>T	S82L	Severe			(Wang 2010 <i>J Hum.Genet</i>)
c.251C>A	A84E	Severe			(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.253G>A	A85T				(Khedhiri 2011 <i>Ann.Biol.Clin.(Paris)</i>)
c.257T>C	L86P				(Dung 2013 <i>Mol.Genet.Metab</i>)
c.263C>T	T88I				(Wang 2010 <i>J Hum.Genet</i>)
c.268C>T	R90W	Severe		Buried	(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.272T>C	L91P	Severe			(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.278T>A	I93N				(Dung 2013 <i>Mol.Genet.Metab</i>)
c.280C>G	R94G			Buried	(Ogawa 1995 <i>Hum.Mol.Genet.</i>)
c.280C>T	R94C		Severe	Buried	(Ogawa 1995 <i>Hum.Mol.Genet.</i>)
c.281G>T	R94L			Buried	(Tomatsu 2005 <i>Hum.Mutat.</i>)

cDNA Mutation	Protein Mutation	Disease Associated or Neutral	Likely Disease Associated or Likely Neutral	Rivera-Colon Mutation Category	First Referenced
c.286G>T	G96C		Severe	Buried	(Bunge 1997 <i>Hum.Mutat.</i>)
c.287G>T	G96V	Severe		Buried	(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.289T>G	F97V		Mild	Buried	(Cole 1996 <i>Am.J.Med.Genet.</i>)
c.304G>A	A102T				Exome Variant Server
c.319G>A	A107T	Severe		Buried	(Tomatsu 2004a <i>Hum.Mutat.</i>)
c.325A>G	T109A				dbSNP
c.332A>G	Q111R	Intermediate		Buried	(Bunge 1997 <i>Hum.Mutat.</i>)
c.337A>T	I113F	Severe		Buried	(Tomatsu 1995 <i>Am.J.Hum.Genet.</i>)
c.346G>A	G116S	Severe		Buried	(Tomatsu 2004 <i>J Hum.Genet.</i>)
c.347G>T	G116V		Likely disease associated*		(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.359C>T	S120L				dbSNP, Exome Variant Server
c.363G>C	E121D	Mild			(Pajares 2012 <i>Mol.Genet.Metab</i>)
c.373C>T	P125S				Exome Variant Server
c.374C>T	P125L	Severe		Buried	(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.405C>G	S135R				(Yamada 1998 <i>Hum.Mutat.</i>)
c.412G>A	V138I				dbSNP, Exome Variant Server
c.413T>C	V138A	Intermediate		Buried	(Tomatsu 1996 <i>Am.J.Hum.Genet.</i>)
c.415G>A	G139S		Intermediate	Buried	(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.421T>A	W141R	Severe		Buried	(Bunge 1997 <i>Hum.Mutat.</i>)
c.423G>T	W141C				(Tomatsu 2004 <i>J Hum.Genet.</i>)
c.425A>G	H142R		Severe	Active site	(Wang 2010 <i>J Hum.Genet</i>)
c.433C>T	H145Y				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.448C>T	H150Y		Mild	Buried	(Tomatsu 2004a <i>Hum.Mutat.</i>)
c.451C>A	P151T	Severe		Buried	(Lee 2012 <i>Korean J.Pediatr.</i>)

cDNA Mutation	Protein Mutation	Disease Associated or Neutral	Likely Disease Associated or Likely Neutral	Rivera-Colon Mutation Category	First Referenced
c.451C>T	P151S	Severe		Buried	(Ogawa 1995 <i>Hum.Mol.Genet.</i>)
c.452C>T	P151L	Severe		Buried	(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.463G>A	G155R	Severe		Surface	(Bunge 1997 <i>Hum.Mutat.</i>)
c.464G>A	G155E			Surface	(Tomatsu 2004 <i>J.Med.Genet.</i>)
c.466T>C	F156L				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.467T>C	F156S			Buried	(Bunge 1997 <i>Hum.Mutat.</i>)
c.467T>G	F156C		Severe	Buried	(Yamada 1998 <i>Hum.Mutat.</i>)
c.477G>T	W159C	Severe		Buried	(Qubbaj 2008 <i>Prenat.Diagn.</i>)
c.482G>A	G161E				(Ye 2013 <i>Zhonghua Er.Ke.Za Zhi.</i>)
c.485C>T	S162F	Severe		Buried	(Kato 1997 <i>Hum.Genet.</i>)
c.487C>A	P163T			Buried	dbSNP
c.488C>A	P163H	Intermediate		Buried	(Wang 2010 <i>J Hum.Genet</i>)
c.491A>C	N164T	Severe		Buried	(Tomatsu 2004 <i>J Hum.Genet.</i>)
c.494G>A	C165Y	Severe			(Kubaski 2013 <i>Gene</i>)
c.497A>G	H166R				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.498C>G	H166Q		Severe	Buried	(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.499T>G	F167V		Likely disease associated*		(Montano 2007 <i>J.Inherit.Metab Dis.</i>)
c.502G>A	G168R		Severe	Buried	(Bunge 1997 <i>Hum.Mutat.</i>)
c.502-503GG>TT	G168L	Severe		Buried	(Wang 2010 <i>J Hum.Genet</i>)
c.512A>C	D171A	Mild		Surface	(Sukegawa 2000 <i>Hum.Mol.Genet.</i>)
c.515A>G	N172S				dbSNP, Exome Variant Server
c.516C>G	N172L				Exome Variant Server
c.530A>G	N177S		Severe		(He 2013 <i>Gene</i>)
c.532A>G	I178V	Neutral			(Bunge 1997 <i>Hum.Mutat.</i>)

cDNA Mutation	Protein Mutation	Disease Associated or Neutral	Likely Disease Associated or Likely Neutral	Rivera-Colon Mutation Category	First Referenced
c.535C>T	P179S			Buried	(Terzioglu 2002 <i>Hum.Mutat.</i>)
c.536C>A	P179H	Severe		Buried	(Bunge 1997 <i>Hum.Mutat.</i>)
p.536C>T	P179L	Severe		Buried	(Yamada 1998 <i>Hum.Mutat.</i>)
c.550T>C	W184R				dbSNP
c.554A>G	E185G				(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.559G>C	V187L				dbSNP
c.599C>T	T200M	Neutral			(Bunge 1997 <i>Hum.Mutat.</i>)
c.602G>A	G201E				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.608C>T	A203V		Severe	Buried	(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.612C>G	N204K	Mild		Surface	(Fukuda 1992 <i>J.Clin.Invest</i>)
c.641T>C	L214P				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.647T>C	F216S				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.664C>T	R222W				dbSNP, Exome Variant Server
c.665G>A	R222Q				dbSNP, Exome Variant Server
c.685T>C	Y229H		Likely disease associated*		dbSNP, Exome Variant Server
c.688T>G	W230G	Severe		Buried	(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.692C>G	A231G	Neutral			(Bunge 1997 <i>Hum.Mutat.</i>)
c.697G>A	D233N		Severe	Buried	(Tomatsu 2004 <i>J.Med.Genet.</i>)
c.700G>A	A234T				Exome Variant Server
c.704C>A	T235K				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.706C>G	H236D	Mild		Active site	(Wang 2010 <i>J Hum.Genet</i>)
c.715G>A	V239I			Buried	dbSNP, Exome Variant Server
c.715G>T	V239F	Severe		Buried	(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.719A>G	Y240C				(Ye 2013 <i>Zhonghua Er.Ke.Za Zhi.</i>)
c.725C>G	S242C				(Lee 2012 <i>Korean J.Pediatr.</i>)

cDNA Mutation	Protein Mutation	Disease Associated or Neutral	Likely Disease Associated or Likely Neutral	Rivera-Colon Mutation Category	First Referenced
c.734T>C	F245S				dbSNP, Exome Variant Server
c.740G>A	G247D	Severe		Surface	(Bunge 1997 <i>Hum.Mutat.</i>)
c.752G>A	R251Q		Severe		(Lee 2012 <i>Korean J.Pediatr.</i>)
c.757C>T	R253W	Mild		Surface	(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.758G>A	R253Q				(Dung 2013 <i>Mol.Genet.Metab</i>)
c.761A>G	Y254C	Severe			(Pajares 2012 <i>Mol.Genet.Metab</i>)
c.769G>A	A257T				(Yamada 1998 <i>Hum.Mutat.</i>)
c.776G>A	R259Q	Mild (very)		Surface	(Bunge 1997 <i>Hum.Mutat.</i>)
c.778G>A	E260K		Severe		(Pajares 2012 <i>Mol.Genet.Metab</i>)
c.780G>C	E260D				(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.791G>C	S264T				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.794T>C	I265T				dbSNP, Exome Variant Server
c.832G>A	A278T				Exome Variant Server
c.833C>T	A278V				dbSNP, Exome Variant Server
c.850T>G	F284V	Mild		Buried	(Yamada 1998 <i>Hum.Mutat.</i>)
c.857C>T	T286M				dbSNP, Exome Variant Server
c.860C>T	S287L	Severe		Buried	(Bunge 1997 <i>Hum.Mutat.</i>)
c.865A>G	N289D				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.866A>G	N289S	Mild		Active Site	(Wang 2010 <i>J Hum.Genet</i>)
c.868G>A	G290S		Severe	Buried	(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.868G>C	G290R		Severe	Buried	(He 2013 <i>Gene</i>)
c.871G>A	A291T	Severe		Buried	(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.872C>A	A291D				(Bunge 1997 <i>Hum.Mutat.</i>)
c.884C>T	S295F	Mild		Surface	(Bunge 1997 <i>Hum.Mutat.</i>)

cDNA Mutation	Protein Mutation	Disease Associated or Neutral	Likely Disease Associated or Likely Neutral	Rivera-Colon Mutation Category	First Referenced
c.887C>T	A296V				dbSNP
c.901G>T	G301C	Severe		Buried	(Bunge 1997 <i>Hum.Mutat.</i>)
c.911G>A	G304D	Severe			(Ye 2013 <i>Zhonghua Er.Ke.Za Zhi.</i>)
c.917T>C	F306S				(He 2013 <i>Gene</i>)
c.920T>C	L307P		Severe	Buried	(Tomatsu 2004 <i>J Hum.Genet.</i>)
c.922T>C	C308R				(Dung 2013 <i>Mol.Genet.Metab</i>)
c.925G>A	G309R				(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.930G>C	K310N		Mild	Active site	(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.934A>G	T312A		Severe	Buried	(Wang 2010 <i>J Hum.Genet</i>)
c.935C>G	T312S	Mild		Buried	(Yamada 1998 <i>Hum.Mutat.</i>)
c.937A>G	T313A				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.938C>T	T313M	Severe			(Dung 2013 <i>Mol.Genet.Metab</i>)
c.943G>A	E315K				(Ye 2013 <i>Zhonghua Er.Ke.Za Zhi.</i>)
c.947G>T	G316V				(Wang 2010 <i>J Hum.Genet</i>)
c.949G>A	G317R				(Pollard 2013 <i>J.Inherit.Metab Dis.</i>)
c.953T>G	M318R	Severe		Buried	(Ogawa 1995 <i>Hum.Mol.Genet.</i>)
c.956G>A	R319K				Exome Variant Server
c.971C>A	A324E				(Wang 2010 <i>J Hum.Genet</i>)
c.975G>T	W325C		Mild	Buried	(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.977G>C	W326S				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.994G>A	A332T				Exome Variant Server
c.1001A>G	Q334R				dbSNP, Exome Variant Server
c.1019G>A	G340D	Severe		Buried	(Tomatsu 2004 <i>J.Med.Genet.</i>)
c.1023C>G	S341R	Severe		Buried	(Tomatsu 2004 <i>J Hum.Genet.</i>)
c.1028T>G	M343R		Severe	Buried	(Ogawa 1995 <i>Hum.Mol.Genet.</i>)

cDNA Mutation	Protein Mutation	Disease Associated or Neutral	Likely Disease Associated or Likely Neutral	Rivera-Colon Mutation Category	First Referenced
c.1030G>A	D344N	Severe		Buried	(Ogawa 1995 <i>Hum.Mol.Genet.</i>)
c.1032C>G	D344E		Severe	Buried	(Bunge 1997 <i>Hum.Mutat.</i>)
c.1034T>C	L345P		Severe	Buried	(Tomatsu 2004 <i>J.Med.Genet.</i>)
c.1038C>A	F346L		Severe	Buried	(Ogawa 1995 <i>Hum.Mol.Genet.</i>)
c.1052C>T	A351V	Severe		Surface	(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.1055T>C	L352P		Mild	Buried	(Tomatsu 2004 <i>J.Med.Genet.</i>)
c.1070C>T	P357L		Severe	Surface	(Tomatsu 2004a <i>Hum.Mutat.</i>)
c.1078G>A	D360N				dbSNP, Exome Variant Server
c.1082G>T	R361G		Severe	Surface	(Bunge 1997 <i>Hum.Mutat.</i>)
c.1088T>C	I363T				dbSNP
c.1097T>C	L366P	Severe			(Wang 2010 <i>J Hum.Genet</i>)
c.1100A>G	N367S				dbSNP, Exome Variant Server
c.1105C>T	L369F				Exome Variant Server
c.1106T>C	L369P				(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.1127G>A	R376Q	Severe		Surface	(Yamada 1998 <i>Hum.Mutat.</i>)
c.1134G>A	M378I				dbSNP, Exome Variant Server
c.1135G>A	D379N				dbSNP, Exome Variant Server
c.1138A>G	R380G	Severe			(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.1139G>C	R380T			Buried	(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.1140G>T	R380S	Mild		Buried	(Tomatsu 2004 <i>J Hum.Genet.</i>)
c.1144A>G	I382V				dbSNP, Exome Variant Server
c.1156C>T	R386C	Severe		Buried	(Ogawa 1995 <i>Hum.Mol.Genet.</i>)
c.1157G>A	R386H		Severe	Buried	(Tomatsu 2004 <i>J Hum.Genet.</i>)
c.1162G>A	D388N		Mild	Surface	(Tomatsu 2004a <i>Hum.Mutat.</i>)
c.1169T>C	L390P	Severe			(Ye 2013 <i>Zhonghua Er.Ke.Za Zhi.</i>)

cDNA Mutation	Protein Mutation	Disease Associated or Neutral	Likely Disease Associated or Likely Neutral	Rivera-Colon Mutation Category	First Referenced
c.1171A>G	M391V	Intermediate		Buried	(Tomatsu 1995 <i>Am.J.Hum.Genet.</i>)
c.1175C>T	A392V	Severe			(Tomatsu 2004a <i>Hum.Mutat.</i>)
c.1177G>T	A393S	Neutral			(Bunge 1997 <i>Hum.Mutat.</i>)
c.1180A>C	T394P		Severe		(Pajares 2012 <i>Mol.Genet.Metab</i>)
c.1183C>G	L395V		Reported Severe, Neutral**	Surface	(Yamada 1998 <i>Hum.Mutat.</i>)
c.1184T>C	L395P			Surface	(Tomatsu 1997 <i>Hum.Mutat.</i>)
c.1186G>A	G396R				Exome Variant Server
c.1192C>G	H398D	Mild		Surface	(Tomatsu 2004 <i>J.Med.Genet.</i>)
c.1998G>A	A400T				dbSNP
c.1201C>T	H401Y				(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.1217C>T	T406I				dbSNP, Exome Variant Server
c.1219A>C	N407H	Intermediate		Buried	(Bunge 1997 <i>Hum.Mutat.</i>)
c.1226G>C	W409S	Intermediate		Surface	(Bunge 1997 <i>Hum.Mutat.</i>)
c.1244G>T	G415V				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.1247T>C	I416T				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.1258C>T	P420S				(Ye 2013 <i>Zhonghua Er.Ke.Za Zhi.</i>)
c.1259C>G	P420R				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.1262G>A	G421E		Likely disease associated*		This study
c.1264C>A	Q422K		Severe	Surface	(Wang 2010 <i>J Hum.Genet</i>)
c.1269C>G	N423K		Neutral		This study
c.1349A>T	E450V				(Ogawa 1995 <i>Hum.Mol.Genet.</i>)
c.1354T>A	F452I		Likely disease associated*	Surface	(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.1354T>C	F452L	Severe		Surface	(Wang 2010 <i>J Hum.Genet</i>)

cDNA Mutation	Protein Mutation	Disease Associated or Neutral	Likely Disease Associated or Likely Neutral	Rivera-Colon Mutation Category	First Referenced
c.1360C>T	L454F				dbSNP
c.1361T>C	L454P				(Ye 2013 <i>Zhonghua Er.Ke.Za Zhi.</i>)
c.1376C>T	A459V	Neutral			(Bunge 1997 <i>Hum.Mutat.</i>)
c.1408T>C	S470P				(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.1414G>A	V472I				dbSNP, Exome Variant Server
c.1438G>T	V480F		Neutral***		dbSNP, Exome Variant Server
c.1450C>T	P484S		Mild	Surface	(Tomatsu 2005 <i>Hum.Mutat.</i>)
c.1460A>G	N487S		Severe	Surface	(Tomatsu 1995 <i>Am.J.Hum.Genet.</i>)
c.1462G>A	V488M	Neutral		Surface	(Ogawa 1995 <i>Hum.Mol.Genet.</i>)
c.1474G>A	A492T				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.1475C>T	A492V				dbSNP, Exome Variant Server
c.1480A>G	M494V	Severe		Buried	(Bunge 1997 <i>Hum.Mutat.</i>)
c.1483A>T	N495Y		Severe		(Pajares 2012 <i>Mol.Genet.Metab</i>)
c.1485C>G	N495K				(Dung 2013 <i>Mol.Genet.Metab</i>)
c.1498G>A	G500S				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.1520G>T	C507F				(Morrone 2014 <i>Mol.Genet.Metab</i>)
c.1525A>G	T509A				dbSNP
c.1526C>G	T509R				dbSNP
c.1540A>G	I514V				dbSNP

If columns "Disease Associated" and "Likely Disease Associated" are grayed out, then the mutation is a "Variant of Unknown Significance".

* Categorized based on enzyme activity results from this study

** L395V categorized as neutral in this study based on enzyme activity testing (85.57% of wild-type activity) although it was reported as severe (Yamada 1998 *Hum.Mutat.*)

*** V480F categorized as likely neutral due to being found in 1.79% of the African American population per Exome Variant Server.

Enzyme activity testing results

In order to determine whether the HEK293 endogenous levels of SUMF1 were sufficient to post-translationally modify all the GALNS expressed (SUMF1 modification is critical for GALNS activity), *GALNS* gene cassettes were transfected with and without SUMF1 in ratios of 1:0, 1:0.5, 1:1 and 1:2 (0 μ g, 0.25 μ g, 0.5 μ g and 0.75 μ g DNA, respectively). A 1:0 ratio of wild-type *GALNS* to SUMF1 had 14.5% of the GALNS enzyme activity compared to cells transfected with a 1:1 ratio of SUMF1 (Figure 6), so endogenous SUMF1 levels appear to be insufficient. Our data suggest that co-transfection of equal amounts of *GALNS* and SUMF1 DNA (0.5 μ g) produced optimal activity (Table 6 and Figure 6).

Table 6: GALNS enzyme activity with and without SUMF1

	pCEP4 (control)	<i>GALNS</i> WT	<i>GALNS</i> / SUMF1 1:0.5	<i>GALNS</i> / SUMF1 1:1	<i>GALNS</i> / SUMF1 1:2	SUMF1
GALNS activity 1	30.59	87.86	479.12	563.58	435.53	12.35
GALNS activity 2	41.79	69.59	502.4	523.93	439.99	5.33
Average	36.19	78.725	490.76	543.76	437.76	8.84
% of 1:1 ratio	6.66%	14.48%	90.25%	100%	80.51%	1.63%

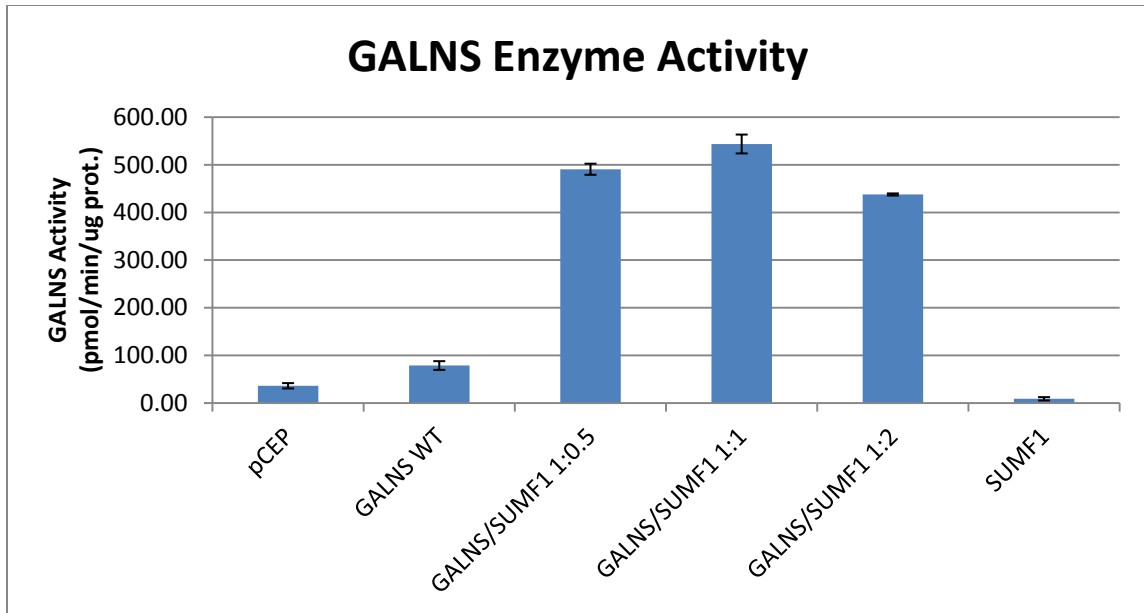


Figure 6: GALNS enzyme activity with and without SUMF1 co-transfection

GALNS enzyme activity is optimized with a 1:1 (i.e., 5 μ g) co-transfection of SUMF1. Each bar represents an average of two experiments.

In order to determine optimum levels of antibody for the GALNS capture assay, levels of mouse monoclonal antibodies (5, 10, and 20 μ g/mL) and rabbit polyclonal antibodies (1, 5 or 10 μ g/mL) were titrated. Our results indicate that the mouse monoclonal antibodies showed increasing activity as the antibody levels were increased up to 20 μ g/mL, while the rabbit polyclonal antibodies were saturated at 5 μ g/mL and had the highest levels of GALNS capture of the two antibody types (Figure 7).

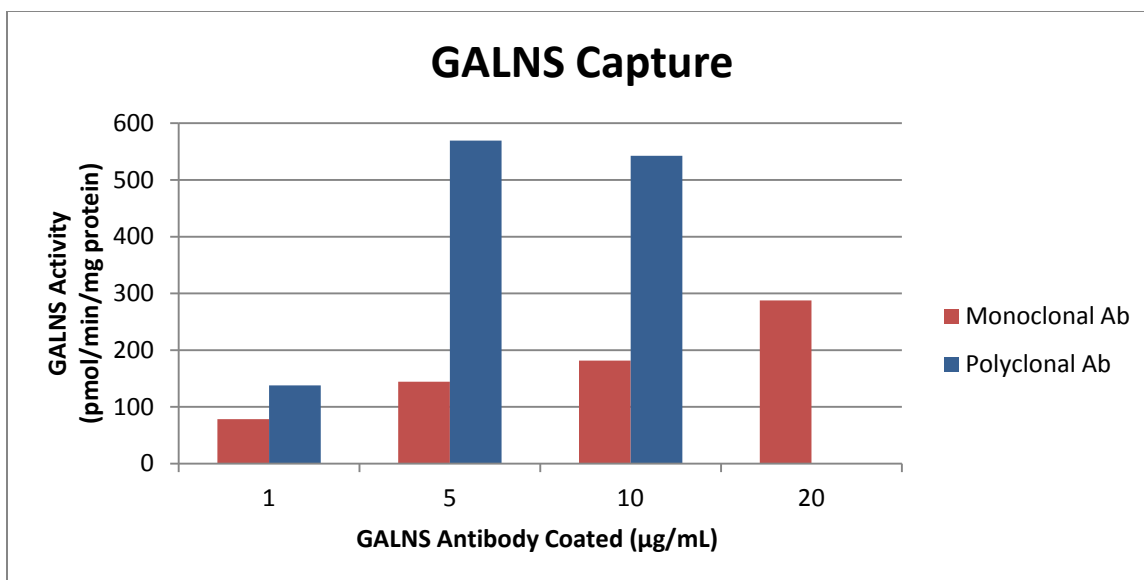


Figure 7: GALNS capture antibody titration

Polyclonal antibodies at 20 µg/mL resulted in the highest GALNS capture levels (background subtracted). Each bar represents an average of two experiments.

Western blot analysis was used to evaluate the presence of processed GALNS. In all but one mutation (A27T), the non-processed 55 kDa protein was present. In mutations with decreased enzyme activity, the 40 and 15 kDa subunit bands seen in wild-type GALNS were either decreased or absent. An example is provided in Figure 8, where the neutral mutations (WT, I178V, A393S and G42E/M41L combo) show bands at 40 and 15 kDa, while the mutants with less activity generally display lower expression levels for the 40 kDa band and non-detectable levels for the 15 kDa subunit.

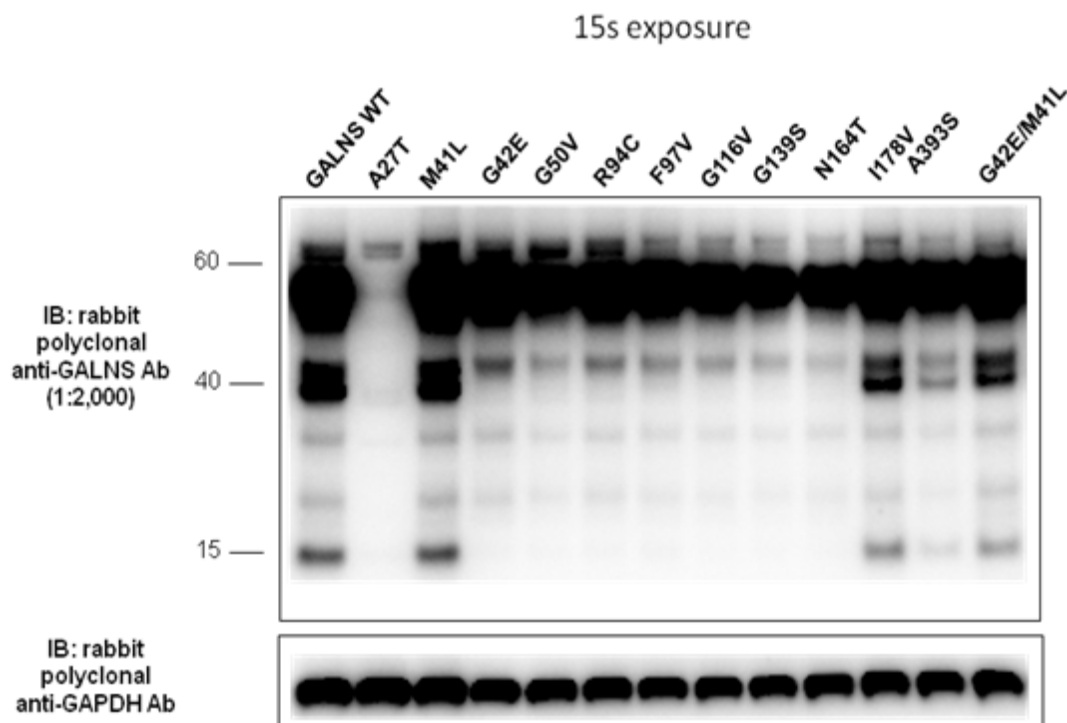


Figure 8: 40 and 15 kDa GALNS bands are expressed at lower to non-detectable levels for mutants with significantly decreased activity

Wild-type and mutants with higher enzyme activity express 40 and 15 kDa at higher levels when compared to mutants with lower enzyme activity.

WT = Wild-type, GALNS mutations A27T (unknown phenotype), M41L (mild), G42E (hypothesized severe), G50V (unknown phenotype), R94C (hypothesized severe), F97V (hypothesized mild), G116V (unknown phenotype), G139S (hypothesized intermediate), N164T (severe), I178V (neutral), A393S (neutral), and G42E/M41L combo (unknown phenotype)

A total of forty-two mutations were created and assayed for enzyme activity. First, a total of 27 deleterious and neutral reported mutations (Table 7) were tested to ensure the assay worked as expected.

Table 7: Reported mutations assayed for enzyme activity

Mutation Type	Mutations	Count
Severe	G47R, I113F, P125L, G155R, N164T, Y254C, R380G, R376Q, R386C and M494V	10
Intermediate	Q111R, M391V and N407H	3
Mild	M41L, E121D, N204K, R259Q, F284V, T312S and H398D	7
Neutral	I178V, T200M, A231G, A393S, A459V, V480F and V488M	7
	Total	27

Results for the seven neutral mutations tested were within expected values, ranging from 49.63% to 93.72% of wild-type activity. Deleterious mutations reported as mild were highly variable, ranging from 2.61% to 94.26% of wild-type activity with a fairly even distribution of the seven mutations within the range. The three intermediate deleterious mutations tested showed two at low levels (1.29% and 4.22%) and one mutation (M391V) at a level considered wild-type (55.56%). M391V has been documented in two separate papers as presenting in patients with intermediate forms of the disease (Tomatsu 2004 *J.Med.Genet.*; Dung 2013 *Mol.Genet.Metab*). Results for nine of the ten severe deleterious mutations were as expected (ranging between 0.98% and 6.22%), however, R376Q showed activity within wild-type range (85.52%). R376Q has been documented in two patients with the severe form of the disease: 1) a homozygous mutation (Yamada 1998 *Hum.Mutat.*) and 2) a compound heterozygous mutation along with severe mutation I113F (Tomatsu 1995 *Am.J.Hum.Genet.*). Graphical representations of the average values and standard deviations for mutations categorized as deleterious or neutral based on published reports are provided in bar chart form in Figure 9, box and whisker plots for severe mutations in Figure 10, intermediate and mild in Figure 11 and neutral mutations in Figure 12. The original data is provided in Table 8.

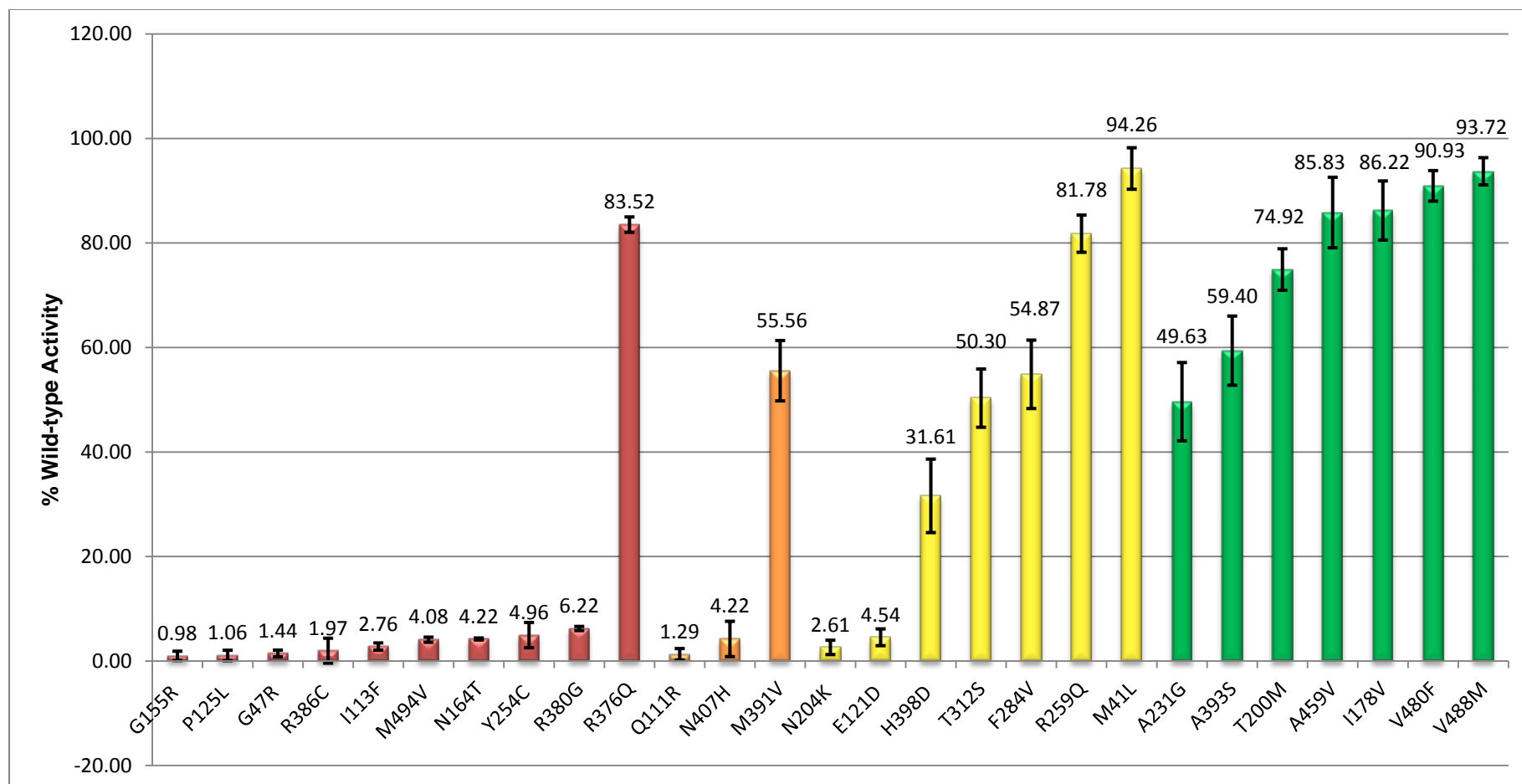


Figure 9: Enzymatic activity for reported GALNS mutations

Enzymatic activity results are consistent with expected results for severe and intermediate phenotypes with one exception each (R376Q and M391V, respectively). Mild phenotype levels range from severe to wild-type activity levels. Each bar represents a minimum of three experiments. Phenotype color coding: Red = Severe, Orange = Intermediate, Yellow = Mild, Green = Neutral

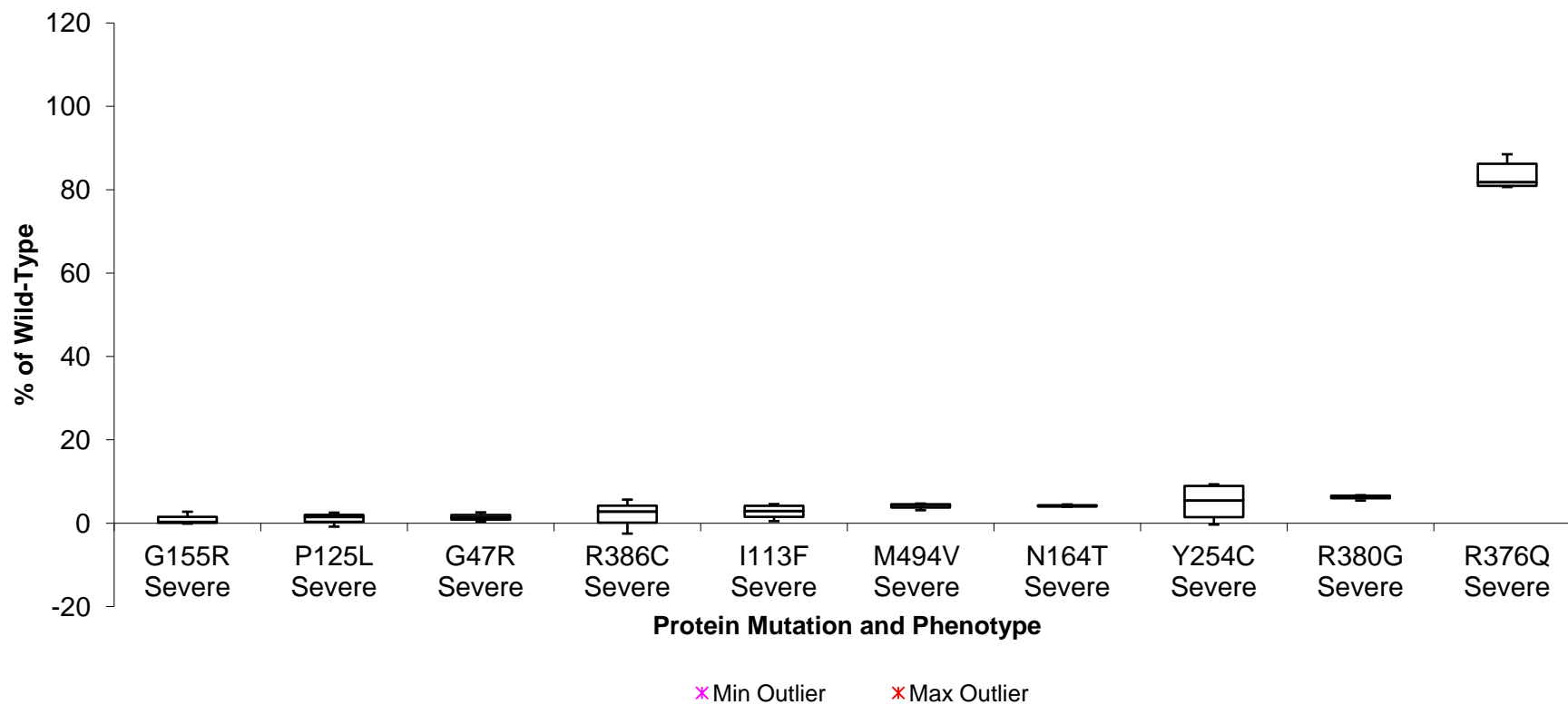


Figure 10: Box and whisker plot for GALNS severe phenotype mutations

Severe phenotype assay results were as expected with the exception of R376Q. Each box represents a minimum of three experiments. Box and Whisker Plot Template courtesy of Vertex42 LLC.

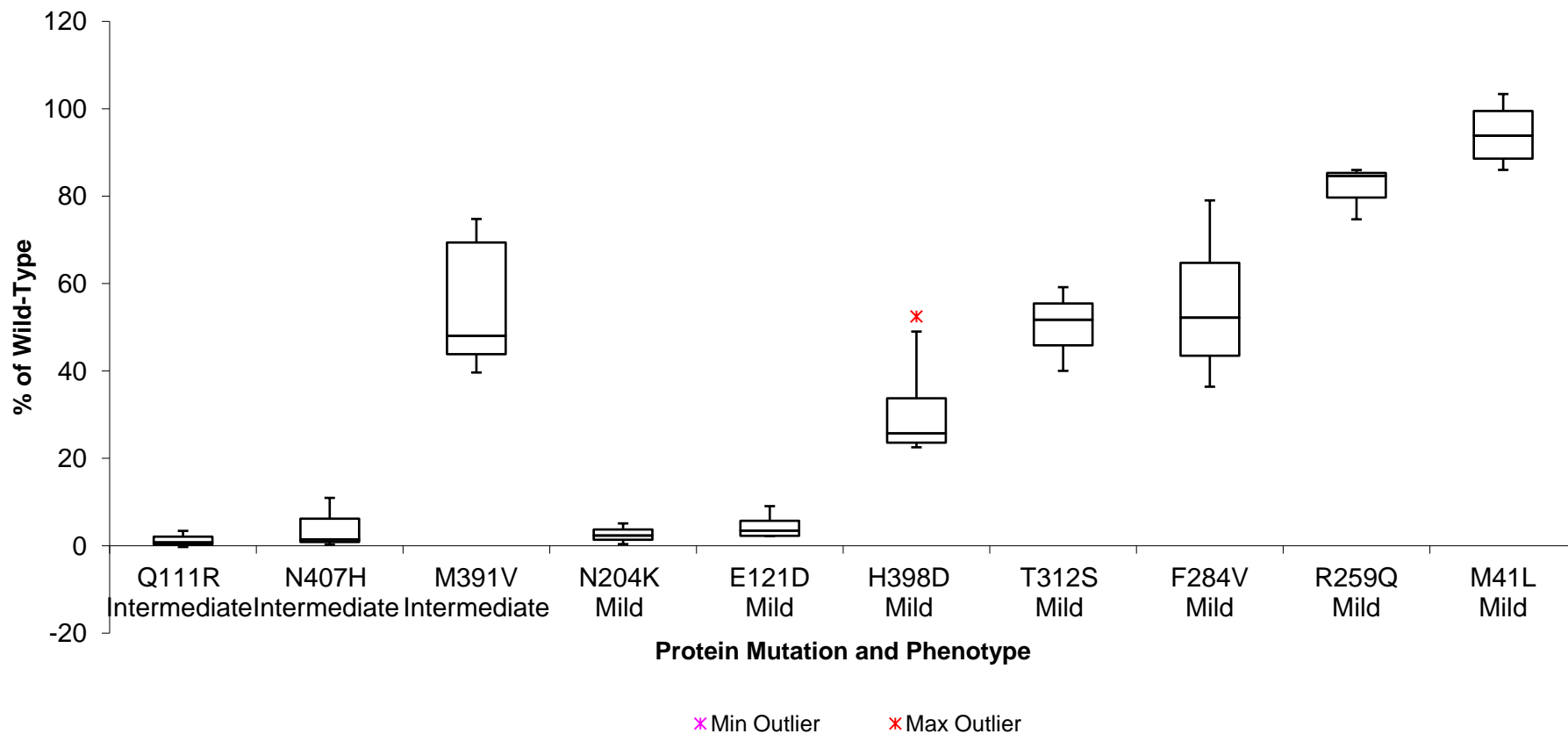


Figure 11: Box and whisker plot for GALNS intermediate and mild phenotype mutations

Intermediate phenotype assay activity results low with the exception of M391V. Mild phenotype assay results cover a wide range. Each box represents a minimum of three experiments. Box and Whisker Plot Template courtesy of Vertex42 LLC.

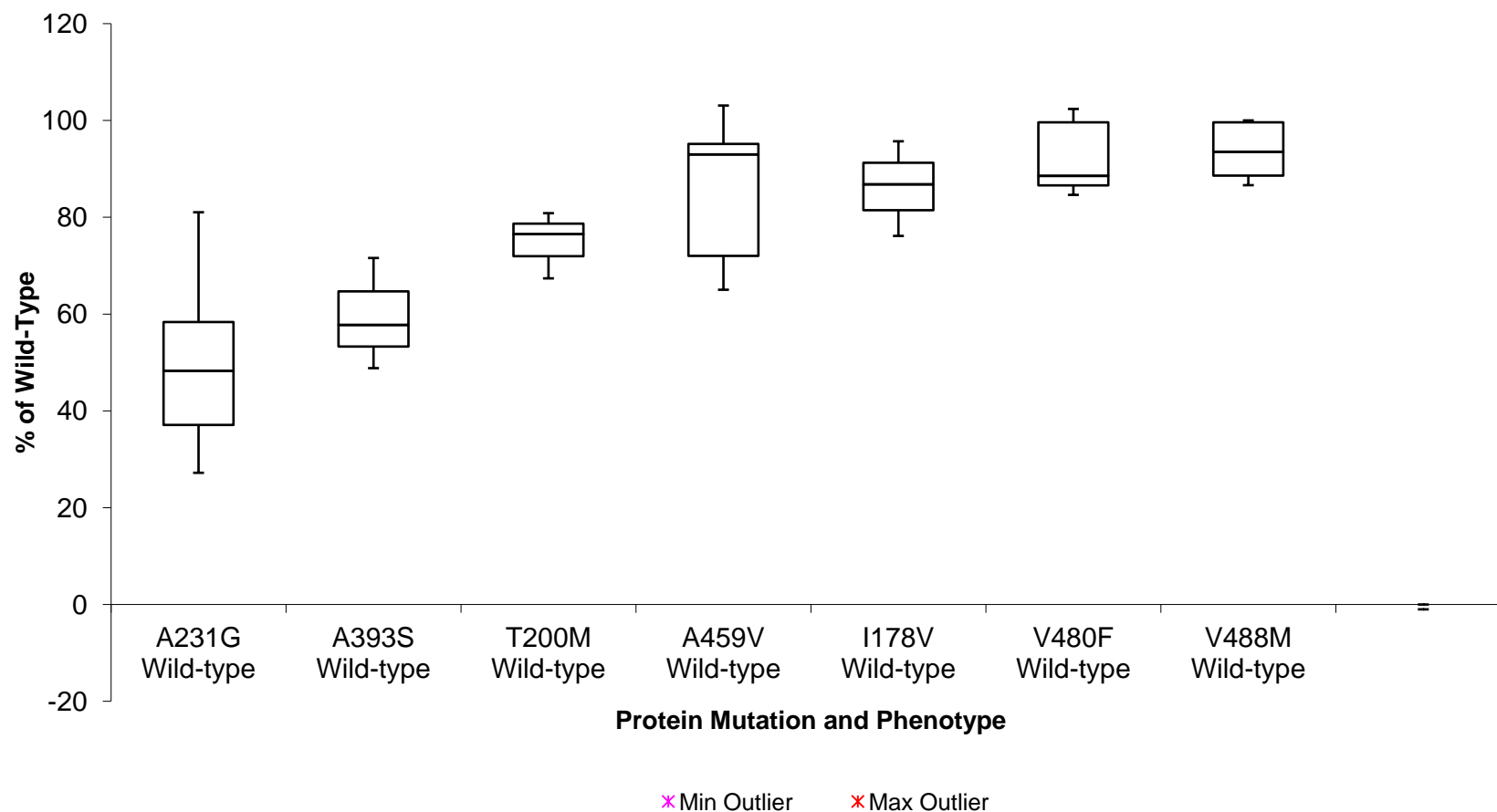


Figure 12: Box and whisker plot for GALNS neutral phenotype mutations

Enzyme activity assay results for neutral mutations average 50% or greater. Each box represents a minimum of three experiments. Box and Whisker Plot Template courtesy of Vertex42 LLC.

Table 8: Enzymatic activity from polyclonal antibody 5 µg/mL capture

cDNA Mutation	Protein Mutation	Phenotype	Notes	Avg	Std Dev	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7
c.139G>A	G47R	Severe		1.44	1.11	1.35	0.38	2.6				
c.374C>T	P125L	Severe		1.06	1.72	1.48	-0.83	2.54				
c.463G>A	G155R	Severe		0.98	1.54	-0.11	0.31	2.75				
c.761A>G	Y254C	Severe		4.96	4.84	-0.33	2.03	8.8	9.33			
c.337A>T	I113F	Severe		2.76	1.71	4.58	2.93	4.58	2.93	0.49	1.07	
c.1127G>A	R376Q	Severe		83.52	3.61	81.78	80.65	81.78	80.65	88.51	87.72	
c.491A>C	N164T	Severe	7/12 predict Deleterious	4.22	0.33	4.59	3.95	4.11				
c.1138A>G	R380G	Severe	6/12 predict Deleterious	6.22	0.69	6.51	5.43	6.72				
c.1480A>G	M494V	Severe		4.08	0.85	4.71	3.11	4.41				
c.1156C>T	R386C	Severe		1.97	4.14	-2.5	2.76	5.66				
c.1171A>G	M391V	Intermediate		55.56	15.28	48.02	39.64	48.02	39.64	74.78	73.18	65.62
c.332A>G	Q111R	Intermediate		1.29	1.90	0.75	-0.29	3.4				
c.1219A>C	N407H	Intermediate		4.22	5.86	10.95	0.28	1.43				
c.850T>G	F284V	Mild		54.87	17.33	52.19	36.39	52.19	36.39	77.28	79.03	50.59
c.121A>T	M41L	Mild	4/12 predict Deleterious	94.26	7.95	86.01	98.18	89.46	103.37			
c.935C>G	T312S	Mild	4/12 predict Deleterious	50.30	9.65	40.02	59.17	51.72				
c.363G>C	E121D	Mild		4.54	3.21	2.29	2.2	9.06	4.61			
c.1192C>G	H398D	Mild		31.61	14.07	52.47	22.53	27.51	23.92			
c.612C>G	N204K	Mild		2.61	2.38	5.11	0.37	2.34				
c.776G>A	R259Q	Mild (very)	4/12 predict Deleterious	81.78	6.17	74.7	85.99	84.65				
c.1462G>A	V488M	Neutral		93.72	6.39	100.01	88.6	100.01	88.6	86.63	98.47	
c.692C>G	A231G	Neutral		49.63	19.82	48.25	27.21	48.25	27.21	81.04	68.47	46.96
c.1177G>T	A393S	Neutral		59.40	11.47	57.77	48.83	71.59				

cDNA Mutation	Protein Mutation	Phenotype	Notes	Avg	Std Dev	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7
c.1376C>T	A459V	Neutral		85.83	16.53	92.99	65.03	92.99	65.03	103.09	95.86	
c.1438G>T	V480F	Neutral		90.93	7.16	88.56	84.63	88.56	84.63	96.84	102.38	
c.532A>G	I178V	Neutral	5/12 predict Deleterious	86.22	9.79	76.15	95.7	86.8				
c.599C>T	T200M	Neutral	5/12 predict Deleterious	74.92	6.88	80.85	76.53	67.38				
c.499T>G	F167V	Unknown		2.33	0.12	2.4	2.41	2.19				
c.415G>A	G139S	Unknown	Hypothesized Intermediate, 12/12 predict Deleterious	3.15	0.99	2.74	4.27	2.43				
c.125G>A	G42E	Unknown	Hypothesized Severe, 11/12 predict Deleterious	4.65	1.22	4.29	5.86	2.82	4.42	6.18	4.35	
c.1262G>A	G421E	Unknown	Dimerization impact, 8/12 predict Deleterious	5.67	0.23	5.93	5.61	5.48				
c.280C>T	R94C	Unknown	Hypothesized Severe, 11/12 predict Deleterious	5.69	2.51	5.84	9.19	4.03	3.71			
c.608C>T	A203V	Unknown	Hypothesized Severe, 5/12 predict Deleterious	6.46	1.04	7.64	6.01	5.72				
c.79G>A	A27T	Unknown	1/12 predict Deleterious	4.13	0.92	3.52	4.08	3.46	5.45			
c.347G>T	G116V	Unknown	12/12 predict Deleterious	3.80	0.44	3.54	4.45	3.52	3.67			
c.868G>A	G290S	Unknown	Hypothesized Severe, 12/12 predict Deleterious	12.46	1.77	12.51	10.66	14.2				
c.1354T>A	F452I	Unknown	Dimerization impact, 5/12 predict Deleterious	19.19	3.00	19.59	21.98	16.01				
c.685T>C	Y229H	Unknown		40.00	17.84	36.76	19.04	36.76	19.04	57.56	66.05	44.8
c.289T>G	F97V	Unknown	Hypothesized Mild, 5/12 predict Deleterious	43.85	16.91	48.19	58.17	25.19				
c.1269C>G	N423K	Unknown	Dimerization impact, 3/12 predict Deleterious	51.41	15.62	64.07	56.2	33.95				

cDNA Mutation	Protein Mutation	Phenotype	Notes	Avg	Std Dev	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7
c.149G>T	G50V	Unknown	Dimerization impact, 12/12 predict Deleterious	3.86	1.63	5.57	4.91	2.66	2.28			
c.1183C>G	L395V	Unknown	Hypothesized Severe, 2/12 predict Deleterious	85.57	13.60	70.25	90.23	96.23				

In addition to reported mutations categorized as either neutral or deleterious, 15 mutations classified as variants of unknown significance by this study were tested (A27T, G42E, G50V, R94C, F97V, G116V, G139S, F167V, A203V, Y229H, G290S, L395V, G421E, N423K, and F452I). Eight mutations (G42E, R94C, F97V, G139S, F167V, A203V, G290S, and L395V) had been previously reported in patients but could not be categorized as deleterious according to the definition used in this study.

Results for the reported mutations ranged from 2.33% to 85.57%. The two mutations with results greater than 50%, N423K with 51.41% and L395V with 85.57%, were included in the neutral dataset. L395V had been reported as a compound heterozygote with the severe mutation I113F in a patient with a severe phenotype (Yamada 1998 *Hum.Mutat.*), which would indicate that L395V activity levels should be as low or lower than I113F (2.76%). However, with 85.57% of wild-type activity, L395V placed well above the 50% cutoff used in this study for wild-type activity levels and was included in the neutral dataset based on our enzyme activity results.

In addition to L395V, seven other mutations had been previously reported. The four mutations reported as severe (G42E, R94C, A203V, and G290S) showed ranges from 4.65% to 12.46%, consistent with expectations. The one mutation reported as intermediate (G139S) showed enzyme activity levels of 3.15% of wild-type. Of the two mutations reported as mild, one (F97V) had results that were consistent (43.85%) and one (F167V) had lower than expected results (2.33%). These seven mutations were categorized as deleterious based

on our enzyme activity results and included in the 1996-2010 dataset as they were reported prior to 2012 so could plausibly be included in training datasets used by the in silico methods.

The unreported mutations ranging below 50% were A27T, G42E, G50V, G116V, F452I and Y229H. These mutations were categorized as deleterious based on our enzyme activity results and included in the 2012-2014 dataset as it is highly unlikely they were included in the training datasets used by the in silico methods.

Graphical representations of the average values and standard deviations for the GALNS variants of unknown significance are provided in bar chart form in Figure 13 and box and whisker plots in Figure 14 and Figure 15. The original data is provided in Table 8.

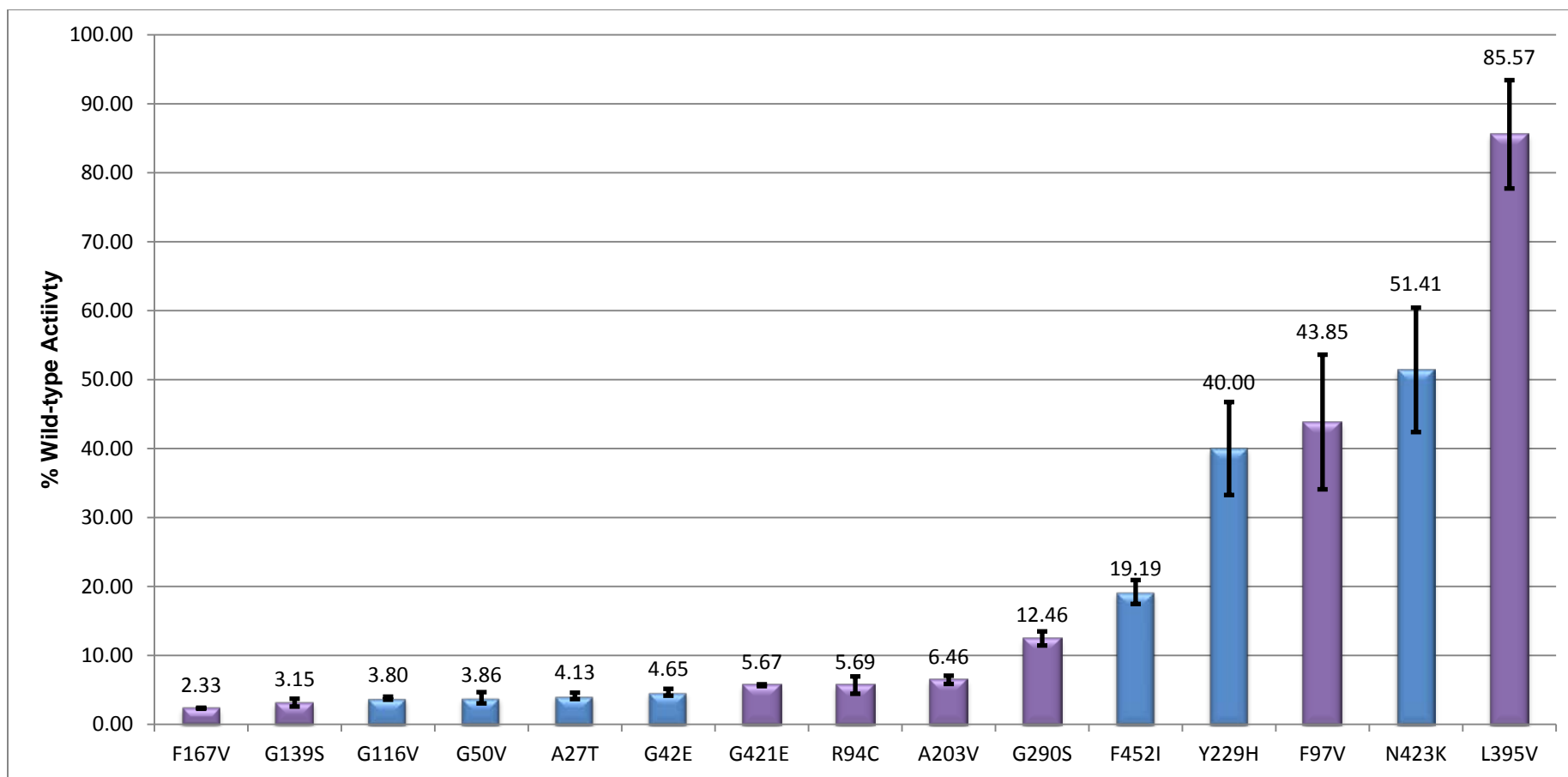


Figure 13: Enzymatic activity for GALNS Variants of Unknown Significance

Enzymatic activity results show four groups ranging from highly likely to be deleterious (<10%), probably deleterious (10-20%), possibly deleterious (40-49%) and unlikely to be deleterious (>50%). Each bar represents a minimum of three experiments. Purple = reported, Blue = unreported

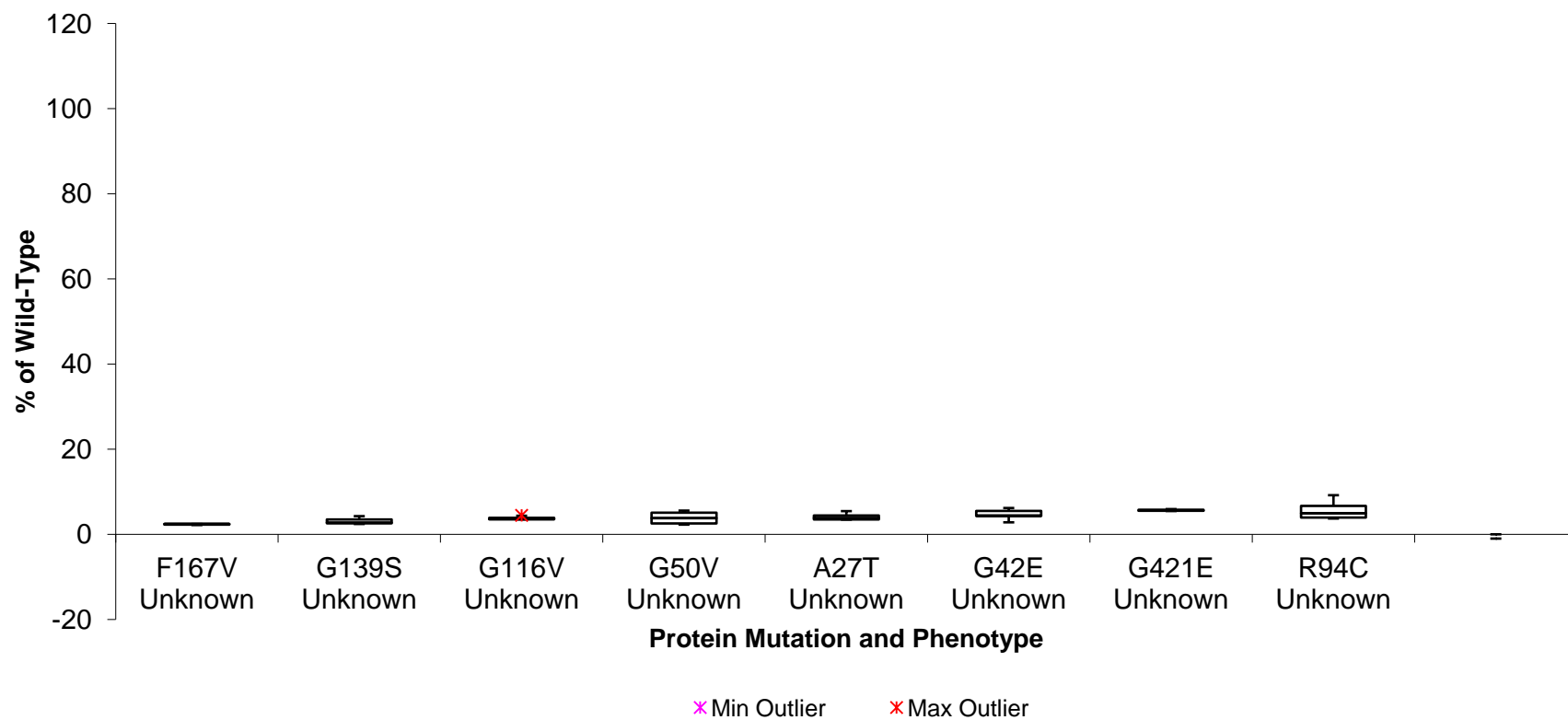


Figure 14: Box and Whisker Plot for GALNS Variants of Unknown Significance Part 1

These mutations are highly likely to be deleterious. Each box represents a minimum of three experiments. Box and Whisker Plot Template courtesy of Vertex42 LLC.

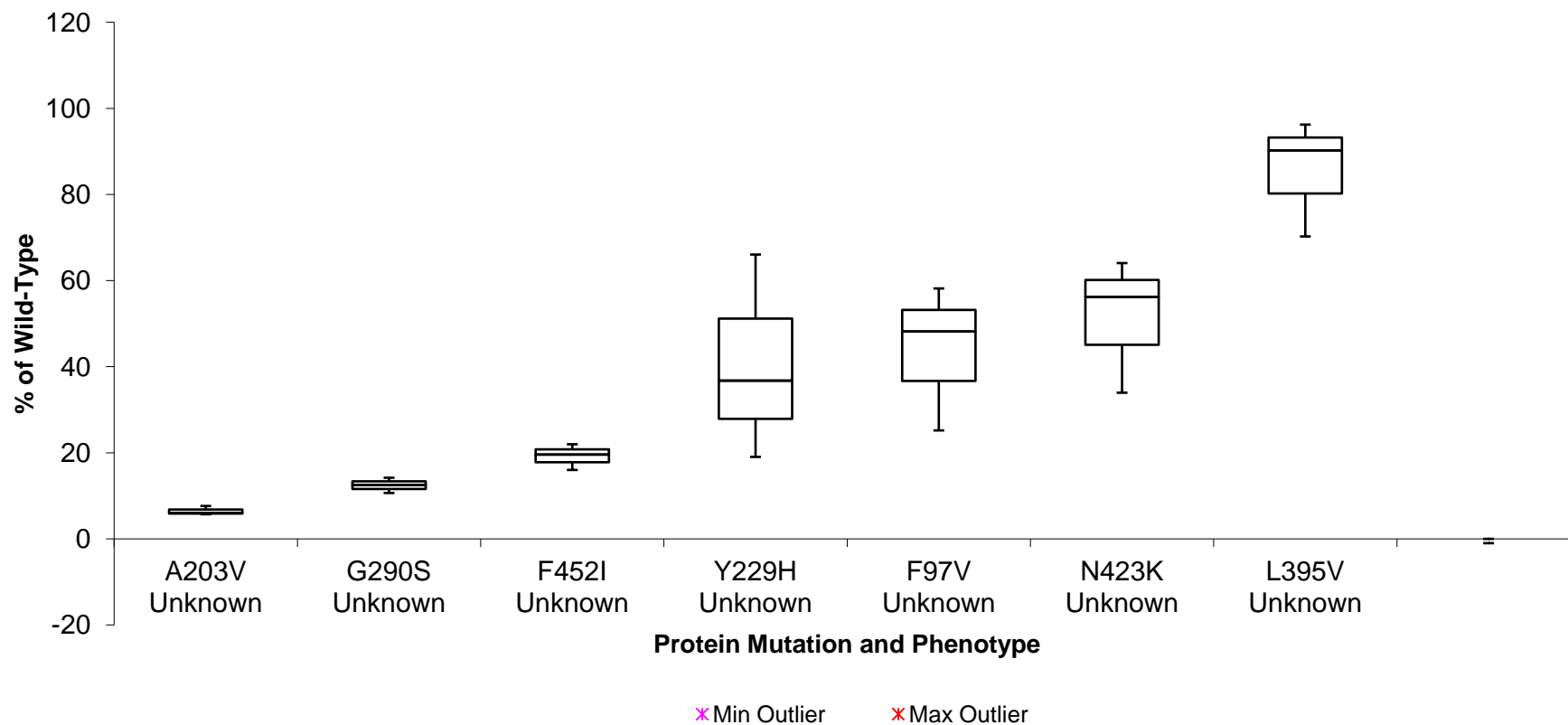


Figure 15: Box and Whisker Plot for GALNS Variants of Unknown Significance Part 2

Results for unknown phenotypes fall into three groups with the mid-group showing activity that overlaps the high and low groups. Each box represents a minimum of three experiments. Box and Whisker Plot Template courtesy of Vertex42 LLC.

In silico methods selection and testing

The 16 in silico methods meeting the three criteria of 1) publically available, web-based in silico methods that does not require any installation and/or coding, 2) able to make predictions on as yet unreported mutations and 3) capable of batch analysis, in alphabetical order, were CANGES, Condel, FastSNP, FATHMM, MuStab, Mutation@A Glance, Mutation Assessor, MutPred v1.2 (hereafter referred to as MutPred), nsSNPAnalyzer, PANTHER v8.1 (PANTHER), PMut, PON-P, PolyPhen-2, PROVEAN, SIFT and SNAP.

Results were not obtained from four of the 16 in silico methods because either 1) the website was no longer maintained (CANGES), 2) the website was not available during the testing period (Mutation@A Glance), 3) the in silico methods could not make predictions for GALNS (FastSNP) or 4) the in silico methods returned results for only 25% of the jobs submitted and more than half of the results returned were not predictions (PON-P) (Table 9).

Table 9: In silico methods for which GALNS mutation predictions were not obtained

In silico methods	URL	Reference	Reason Results not Obtained
CANGES	http://csblcanges.fimm.fi/CANGES/	(Karinen 2011 <i>PLoS. ONE.</i>)	Website no longer maintained
FastSNP	http://fastsnp.ibms.sinica.edu.tw/pages/input_novel.jsp	(Yuan 2006 <i>Nucleic Acids Res.</i>)	Unable to make predictions for GALNS
Mutation@A Glance	http://rapid.rcai.riken.jp/mutation/	(Hijikata 2010 <i>DNA Res.</i>)	Website not available during testing period due to a cyber attack
PON-P	http://bioinf.uta.fi/PON-P/ponp_addform.shtml	(Olatubosun 2012 <i>Hum. Mutat.</i>)	Only 25% of jobs submitted returned results (the rest failed to complete) and more than half of the results returned were not a prediction (i.e., values of either “unclassified” or “NA”)

Predictions were obtained from the other 12 in silico methods, i.e., Condel, FATHMM, MuStab, Mutation Assessor, MutPred, nsSNPAnalyzer, PANTHER, PMut, PolyPhen-2, PROVEAN, SIFT and SNAP. Four in silico methods use independently created algorithms (Condel, Mutation Assessor, PROVEAN and SIFT), with Condel being a weighted average score based on predictions from SIFT, PolyPhen-2, MAPP, LogR, Pfam E-value and Mutation Assessor). Seven in silico methods use some variant of the Bayesian rule (FATHMM, MutPred, nsSNPAnalyzer, PANTHER, PMut, Polyphen-2 and SNAP). One in silico method uses a support vector machines algorithm (MuStab). See Table 10 for details regarding algorithms and training datasets.

Table 10: In silico methods for which GALNS mutation predictions were obtained

In silico methods	Classification Method	Training Datasets	URL	Reference
Condel	Weighted average score (WAS) based on the probabilities that predictions from five other in silico methods (SIFT, PolyPhen-2, MAPP, LogR Pfam E-value, and Mutation Assessor) are not false positives or false negatives	HumVar HumDiv	http://bg.upf.edu/condel/home	(Gonzalez-Perez 2011 <i>Am.J.Hum.Genet.</i>)
FATHMM	Hidden Markov models (HMMs) evaluation of the alignment of homologous sequences and conserved protein domains	HGMD UniProt VariBench Hicks et al 2011 SwissVar	http://fathmm.biocompute.org.uk/	(Shihab 2013 <i>Hum.Mutat.</i>)
MuStab	Support Vector Machines (SVM) algorithm used to predict free energy change ($\Delta\Delta G$)	i-Mutant 2.0 iPTREE-STAB	http://bioinfo.ggc.org/mustab/	(Teng 2010 <i>BMC.Genomics</i>)
Mutation Assessor	Combinatorial entropy measurement assessment of homologous conservation	HUMSAVAR IARC TP53 (cancer) COSMIC database (cancer)	http://mutationassessor.org/	(Reva 2011 <i>Nucleic Acids Res.</i>)
MutPred v1.2	Random Forest machine learning method analysis of the following characteristics: <ul style="list-style-type: none"> • Predicted protein structure and dynamics (PSI-BLAST, Evolutionary conservation score, likelihood of mutation appearing in UniRef80 or Protein Data Bank databases) • Predicted functional properties (DNA-binding residues, catalytic residues, Calmodulin-binding targets which is used as a substitute for predicting Molecular Recognition Fragments or MoRFs, Phosphorylation, Ubiquitination, Glycosylation) • Predicted amino acid sequence and evolutionary information (Secondary structure, Solvent accessibility, Transmembrane helices, Coiled-coil structure, Stability, B-factor, intrinsic disorder) <p>Note: Earlier versions used SIFT for the evolutionary conservation score, but SIFT was replaced in v1.2</p>	HGMD Swiss-Prot	http://mutpred.mutdb.org	(Li 2009 <i>Bioinformatics.</i>)

In silico methods	Classification Method	Training Datasets	URL	Reference
nsSNPAnalyzer	Random Forest machine learning method that based on homologous structure/sequence and SIFT evolutionary conservation calculates: <ul style="list-style-type: none"> • SNP structural environment, including solvent accessibility, environmental polarity and secondary structure • Substitution normalized probability • Similarity with original amino acid 	SwissProt	http://snpanalyzer.ut.hsc.edu	(Bao 2005 <i>Nucleic Acids Res.</i>)
PANTHER v8.1	Hidden Markov Model (HMM) alignment with a database of internally generated orthologs grouped by phylogenetic trees and annotated for family, subfamily, gene function and protein class	UniProt SwissProt	http://www.pantherdb.org/tools/csnpScoreForm.jsp	(Thomas 2003 <i>Genome Res.</i>)
PMut	Evaluation by two neural networks of: <ul style="list-style-type: none"> • Mutational hot spots as determined by alanine scanning, massive mutation and genetically accessible mutations • SNP analysis based on internal databases, PHD output and multiple alignments from PSI-BLAST 	"Human mutational data" (no further definition provided)	http://mmb2.pcb.ub.es:8080/PMut/	(Ferrer-Costa 2005 <i>Bioinformatics.</i>)
PolyPhen-2	Naïve Bayes posterior probability of the substitution's functional impact based on: <ul style="list-style-type: none"> • PSIC score for wild-type allele • Difference in PSIC scores for wild-type and mutant alleles • Number of residues at multiple alignment position • Change in residue side chain volume • Pfam domain hit or not • Congruency of mutant allele with multiple alignment • Similarity to closest wild-type homolog deviation • If located in a CpG region • Normalized accessible surface area of amino acid residue • Crystallographic beta-factor • For buried residues, change in accessible surface area propensity 	HumDiv HumVar3	http://genetics.bwh.harvard.edu/pph2/bgi.shtml	(Adzhubei 2010 <i>Nat.Methods</i>)
PROVEAN	Protein Variation Effect Analyzer (PROVEAN) algorithm generates alignment scores quantifying protein function impact using a substitution matrix and gap penalties	UniProtKB SwissProt	http://provean.jcvi.org/	(Choi 2012 <i>PLoS.ONE.</i>)

In silico methods	Classification Method	Training Datasets	URL	Reference
SIFT	Normalized probability of observing new amino acid at a position based on sequence alignment	HumDiv HumVar	http://sift.jcvi.org/	(Sim 2012a <i>Nucleic Acids Res.</i>)
SNAP	Neural network algorithm predicting functional effects based on residue conservation and protein structure predicted effects (e.g., secondary structure, solvent accessibility)	Internally compiled datasets derived from Protein Mutant Database and SwissProt	http://rostlab.org/services/snap/submit	(Bromberg 2007 <i>Nucleic Acids Res.</i>)

Although all the missense mutations used for analyzing the in silico methods are produced by a single nucleotide change, four methods were not able to make predictions for some of the GALNS mutations. Condel could not make predictions for eight of the mutations, six in dataset 1996-2010 and two in dataset 2012-2014. MuStab and Mutation Assessor were both unable to predict one mutation in dataset 1996-2010. PANTHER was unable to predict 11 mutations, ten in dataset 1996-2010 and three in dataset 2012-2014. Two of the mutations were neutral (I178V and N423K) so they appear in both datasets. The in silico methods and individual mutations for which results were not returned are listed in Table 11.

Table 11: In silico methods and individual mutations for which results were not returned

In Silico Method	# N/A Results	1996-2010	2012-2014
Condel	8	S82L, A107T, W141R*, G168L, R253W, R380S	S82P, R380G
MuStab	1	M1V	
Mutation Assessor	1	M1V	
PANTHER	11	M1V, Q111R*, I113F**, I178V*.,***, P179H*, P179L, S295F*, G301C*, Q422K, N423K***	I178V*.,***, G421E, N423K***

* These mutations were reported in 1997 by (Bunge 1997 *Hum.Mutat.*).

** I113F is the second more reported mutation in literature after R386C.

*** I178V and N423K are neutral mutations so appear in all three datasets

In silico method evaluation

Two datasets were generated in order to compare the effects of mutations that might or might not have been in the training datasets. Dataset 1996-2010 represents all the GALNS missense mutations that might have been in the in silico methods training datasets. The dataset name does not include 2011

because all mutations published in 2011 were categorized as variants of unknown significance so they could not be included in the datasets. This dataset includes 93 deleterious mutations.

Dataset 2012-2014 represents the mutations that were probably not in the training datasets. The year 2012 was selected as the cutoff for the following reasons: 1) nine of the 12 in silico methods published results prior to 2012, 2) the other three in silico methods submitted their manuscripts within the first four months of 2012, 3) the two papers with novel mutations published in 2012 were accepted in March and September, respectively (Pajares 2012 *Mol.Genet.Metab*; Lee 2012 *Korean J.Pediatr.*). This dataset contains 26 deleterious mutations.

The in silico method predictions were individually evaluated based on the six measurements of sensitivity, specificity, precision, NPV, accuracy and MCC for each of the datasets. For dataset 1996-2010, MutPred scored highest in accuracy (97.06%), sensitivity (100%), NPV (100%) and MCC (0.82). Condel and nsSNPAnalyzer tied for first with 100% on both precision and specificity. The six measurements are graphically represented in Figure 16, Figure 17, Figure 18, Figure 19, Figure 20, and Figure 21 and original data provided in Table 12.

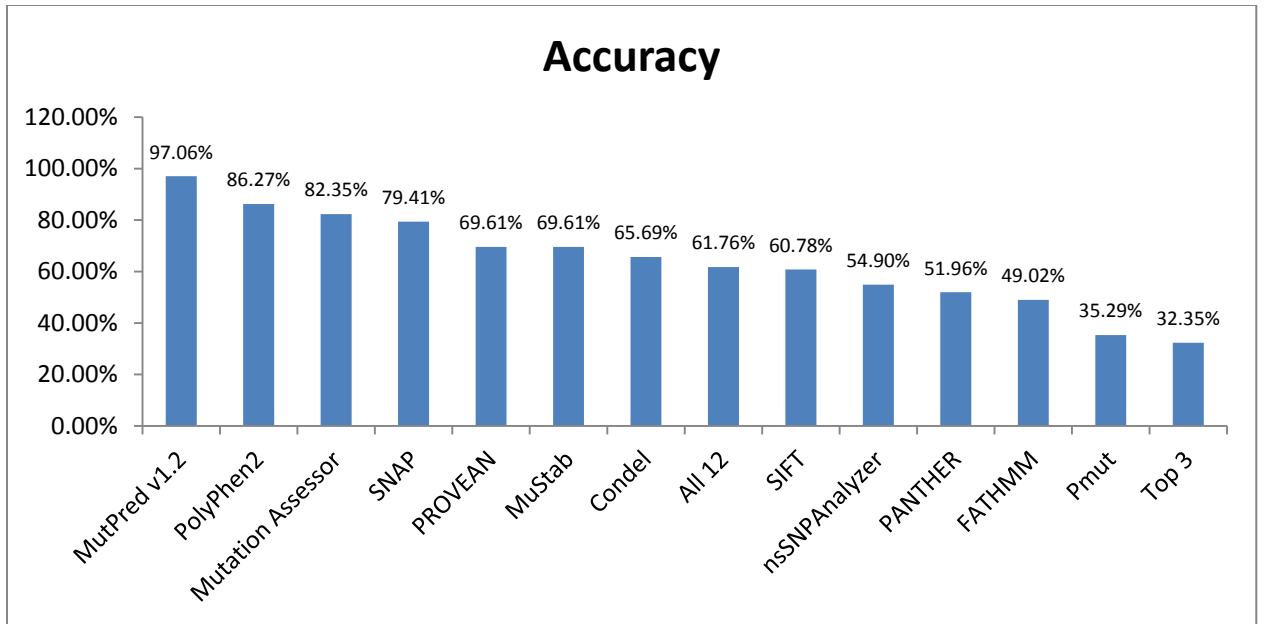


Figure 16: Accuracy scores for 1996-2010 dataset

Accuracy shows a step-wise progression of results for this dataset
 1996-2010 dataset represents mutations that might be included in training datasets

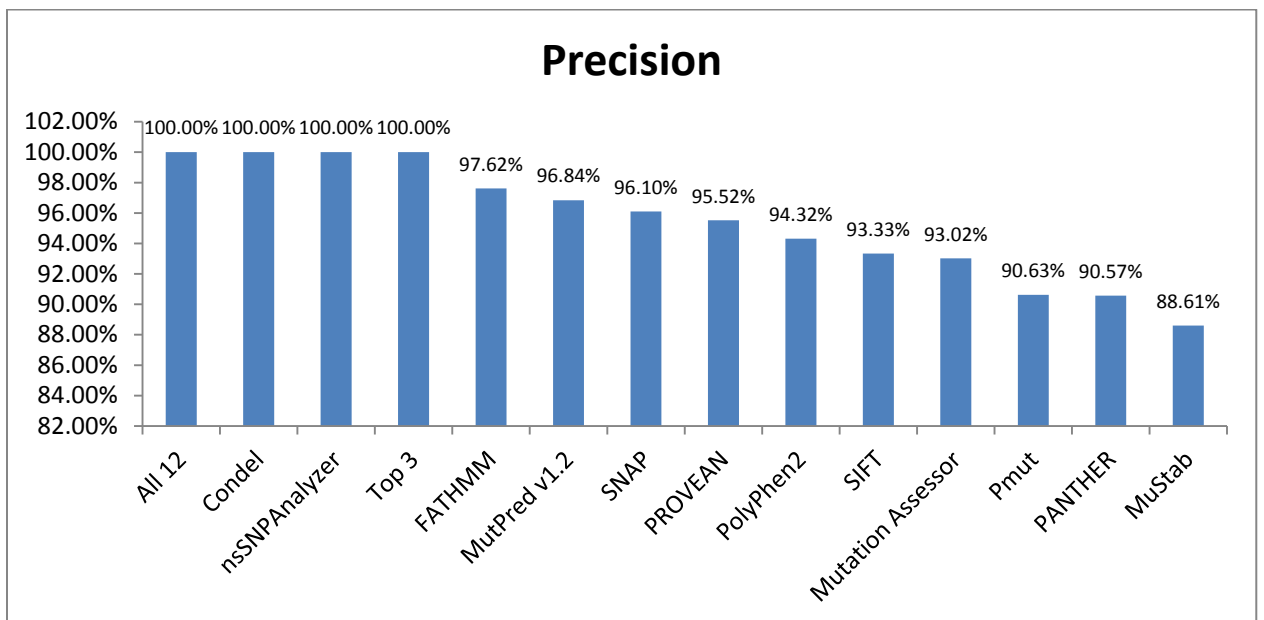


Figure 17: Precision scores for 1996-2010 dataset

Precision shows most packages score 90% or higher for this dataset
 1996-2010 dataset represents mutations that might be included in training datasets

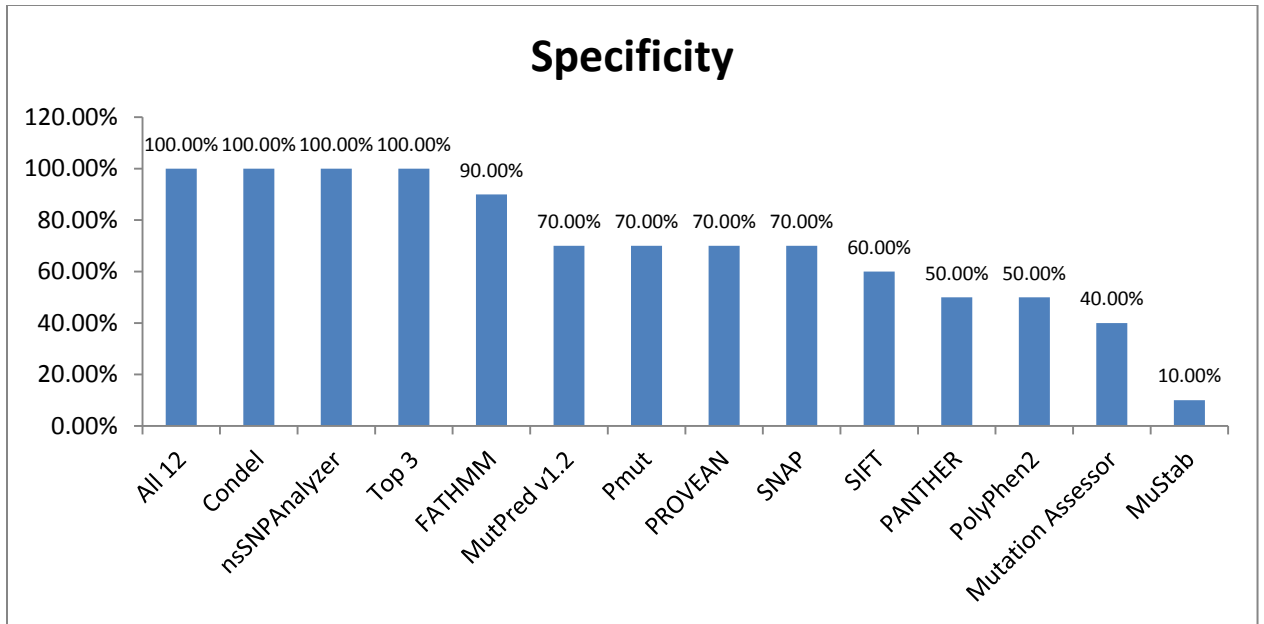


Figure 18: Specificity scores for 1996-2010 dataset

Specificity shows a wide range of clustered results for this dataset
 1996-2010 dataset represents mutations that might be included in training datasets

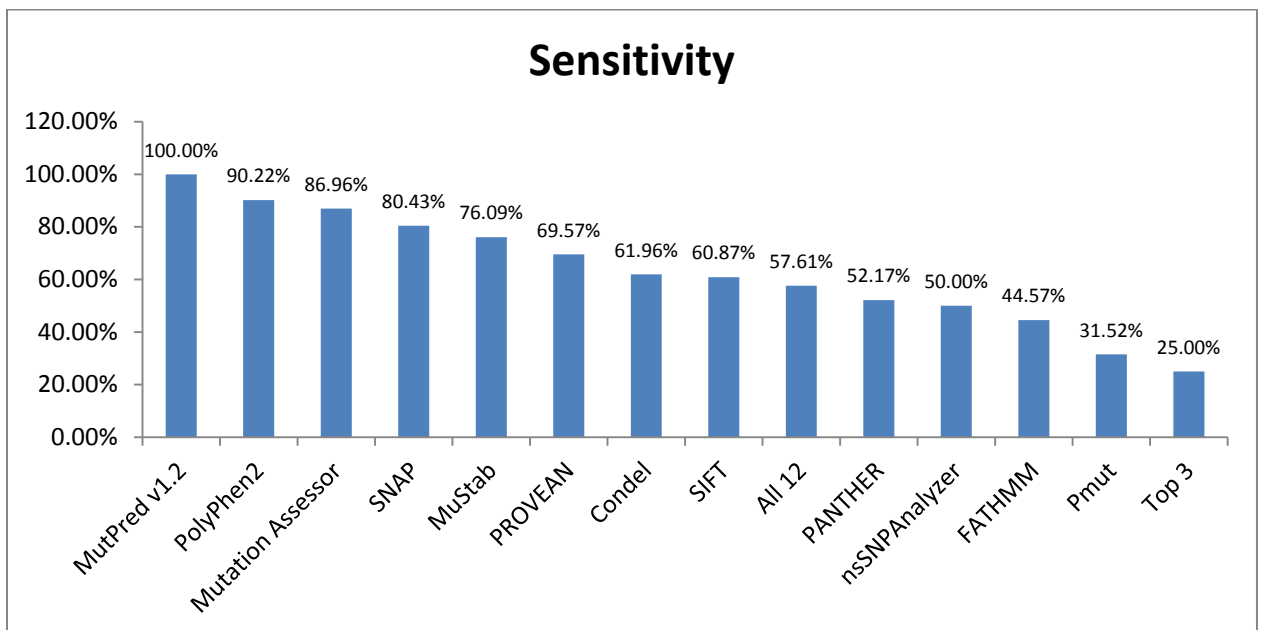


Figure 19: Sensitivity scores for 1996-2010 dataset

Sensitivity shows MutPred leading the others for this dataset
 1996-2010 dataset represents mutations that might be included in training datasets

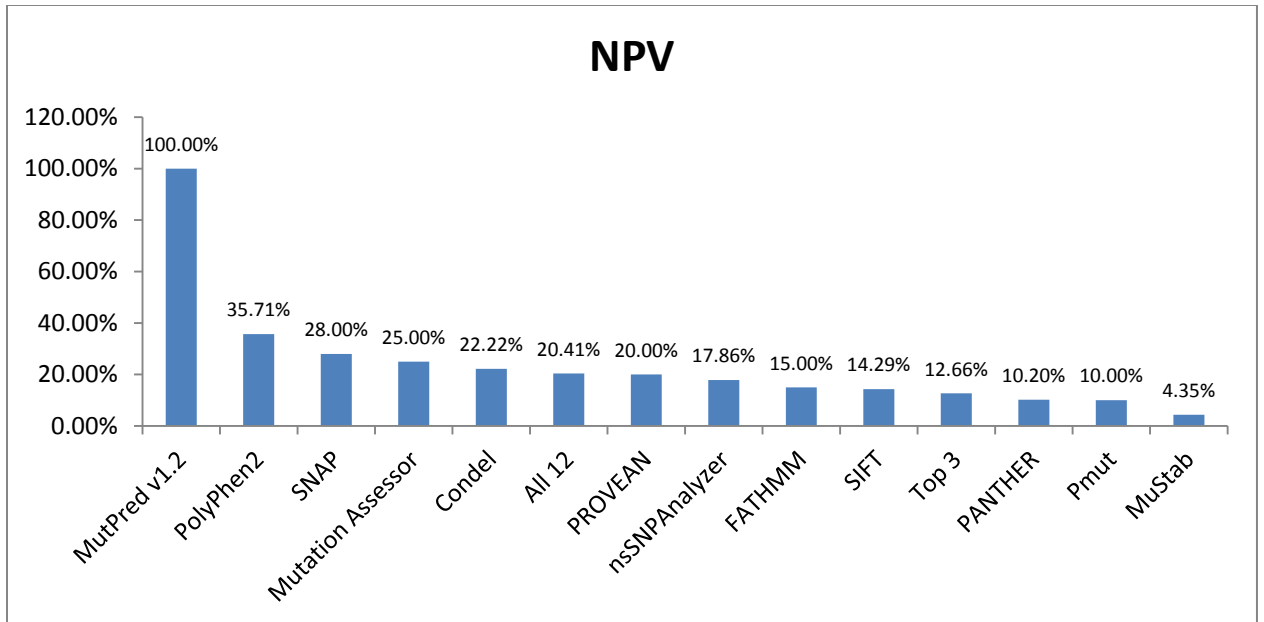


Figure 20: NPV scores for 1996-2010 dataset

NPV shows MutPred clearly leading the others for this dataset

1996-2010 dataset represents mutations that might be included in training datasets

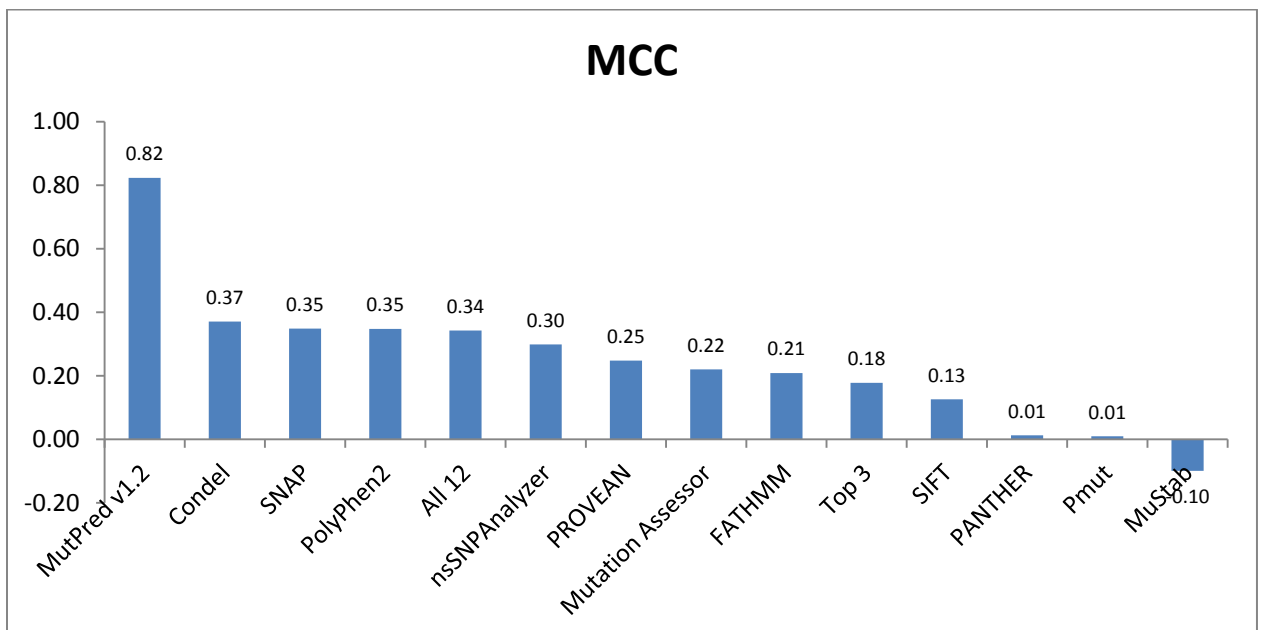


Figure 21: MCC scores for 1996-2010 dataset

MCC shows MutPred is the clear leader for this dataset

1996-2010 dataset represents mutations that might be included in training datasets

Table 12: In silico method scores for the six measurements for dataset 1996-2010

In Silico Method	tn ¹	tp ²	fn ³	fp ⁴	Accuracy	Precision	Specificity	Sensitivity	NPV	MCC
Condel	10	57	35	0	65.69%	100.00%	100.00%	61.96%	22.22%	0.37
FATHMM	9	41	51	1	49.02%	97.62%	90.00%	44.57%	15.00%	0.21
MuStab	1	70	22	9	69.61%	88.61%	10.00%	76.09%	4.35%	-0.10
Mutation Assessor	4	80	12	6	82.35%	93.02%	40.00%	86.96%	25.00%	0.22
MutPred v1.2	7	92	0	3	97.06%	96.84%	70.00%	100.00%	100.00%	0.82
nsSNPAnalyzer	10	46	46	0	54.90%	100.00%	100.00%	50.00%	17.86%	0.30
PANTHER	5	48	44	5	51.96%	90.57%	50.00%	52.17%	10.20%	0.01
PMut	7	29	63	3	35.29%	90.63%	70.00%	31.52%	10.00%	0.01
PolyPhen-2	5	83	9	5	86.27%	94.32%	50.00%	90.22%	35.71%	0.35
PROVEAN	7	64	28	3	69.61%	95.52%	70.00%	69.57%	20.00%	0.25
SIFT	6	56	36	4	60.78%	93.33%	60.00%	60.87%	14.29%	0.13
SNAP	7	74	18	3	79.41%	96.10%	70.00%	80.43%	28.00%	0.35
Top 3 ⁵	10	23	69	0	32.35%	100.00%	100.00%	25.00%	12.66%	0.18
All 12 ⁶	10	53	39	0	61.76%	100.00%	100.00%	57.61%	20.41%	0.34
Expected values	10	92	0	0						

¹ tn = true negative

² tp = true positive

³ fn = false negative

⁴ fp = false positive

⁵ Top 3 are Condel, MutPred and nsSNPAnalyzer, unanimity considered deleterious

⁶ All 12 is all 12 packages with at least 8/12 predicting deleterious before considered deleterious

For dataset 2012-2014, three in silico methods tied for first place in accuracy with 86.11%: Condel, MutPred and PROVEAN. Condel and nsSNPAnalyzer tied for first place in precision and specificity with 100% each. Mutation Assessor scored highest in sensitivity and NPV (96.15% and 80.00%, respectively). Condel also scored highest on MCC with 0.73. The six measurements are graphically represented in Figure 22, Figure 23, Figure 24, Figure 25, Figure 26, and Figure 27 and original data provided in Table 13.

Two combinations of in silico methods were also evaluated: the top 3 and all 12. The combinations tied for first place in precision and specificity with Condel and nsSNPAnalyzer (100%), they didn't rank higher than the top 3 in the other measurements on either dataset except for MCC, where the all 12 combination ranked second (0.69) after Condel (0.73), and before nsSNPAnalyzer (0.66) and MutPred (0.64). Results for the combinations are presented graphically and tabularly with the individual in silico method figures and tables.

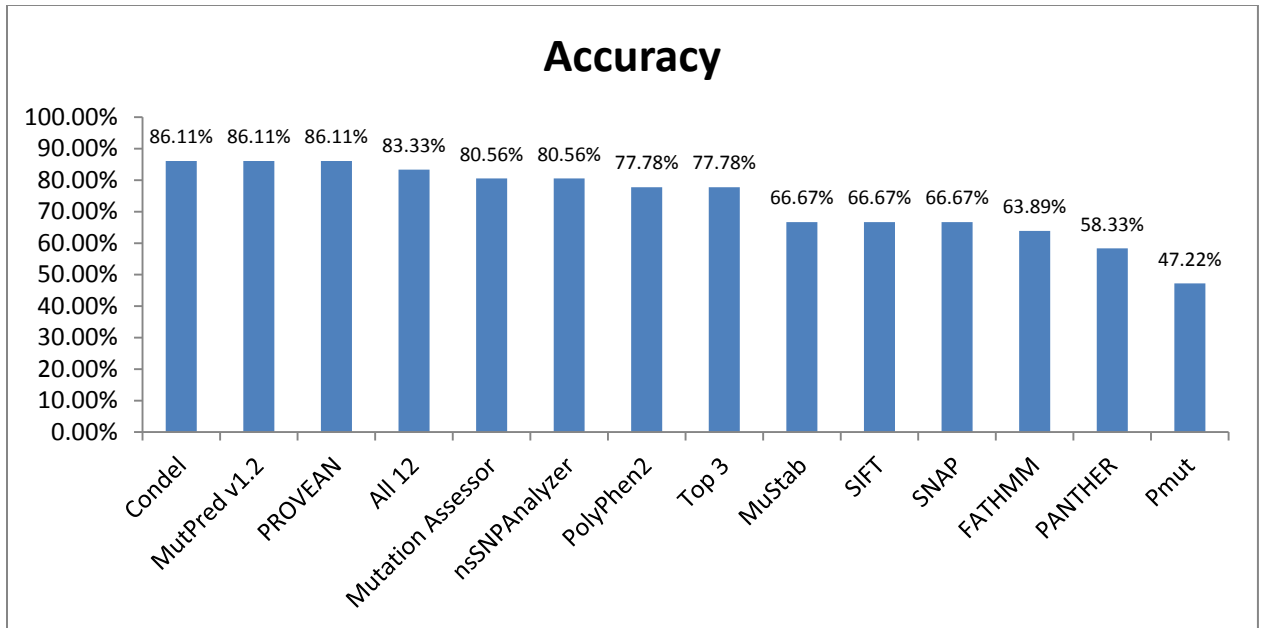


Figure 22: Accuracy scores for 2012-2014 dataset

Accuracy scores shows a range of clustered results for this dataset

2012-2014 dataset represents mutations that were not included in the training datasets

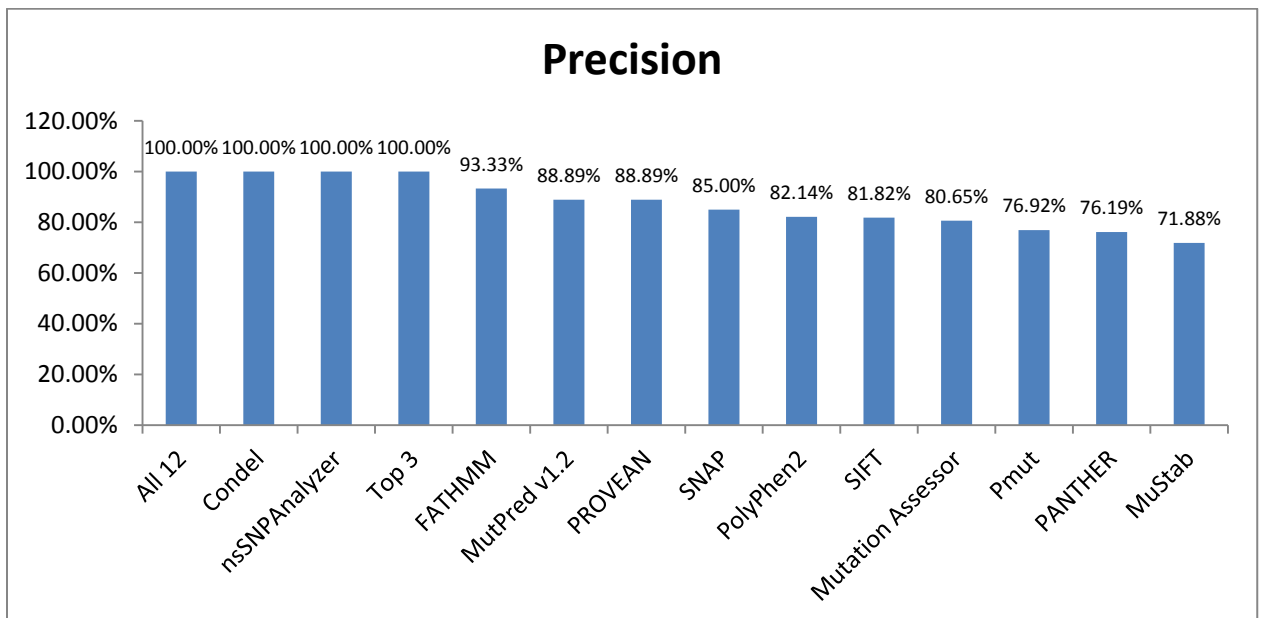


Figure 23: Precision scores for 2012-2014 dataset

Precision high scores were comparable for both datasets. Low scores for this dataset were lower than 1996-2010.

2012-2014 dataset represents mutations that were not included in the training datasets

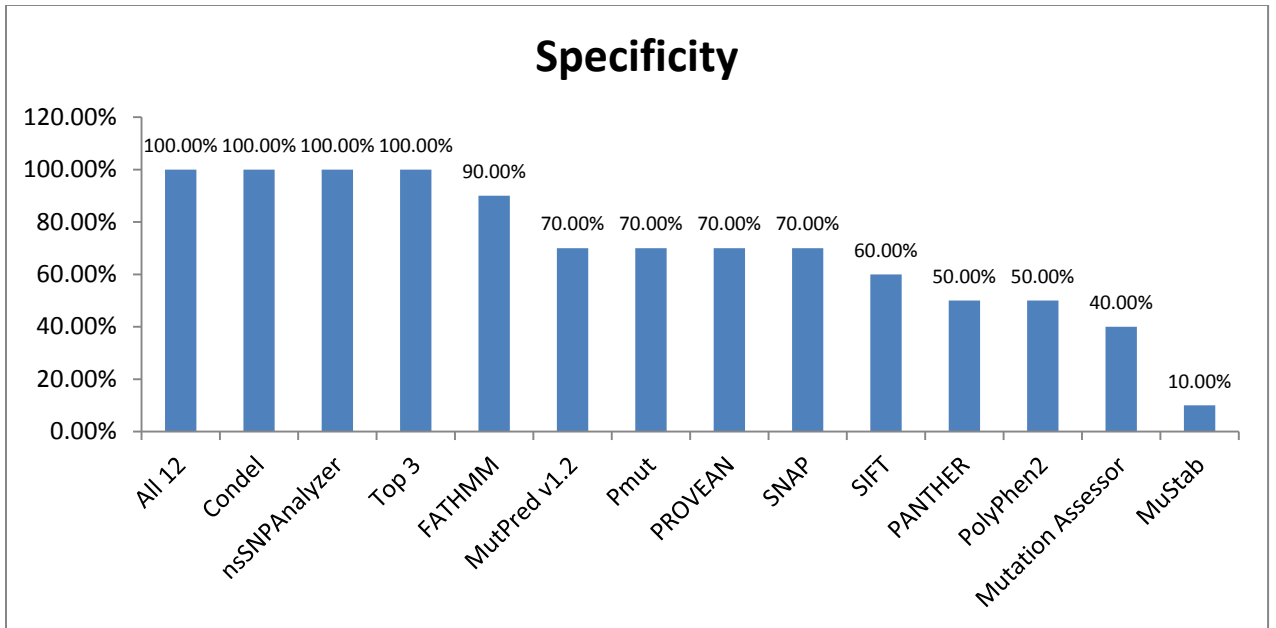


Figure 24: Specificity scores for 2012-2014 dataset

Specificity scores were comparable across both datasets
 2012-2014 dataset represents mutations that were not included in the training datasets

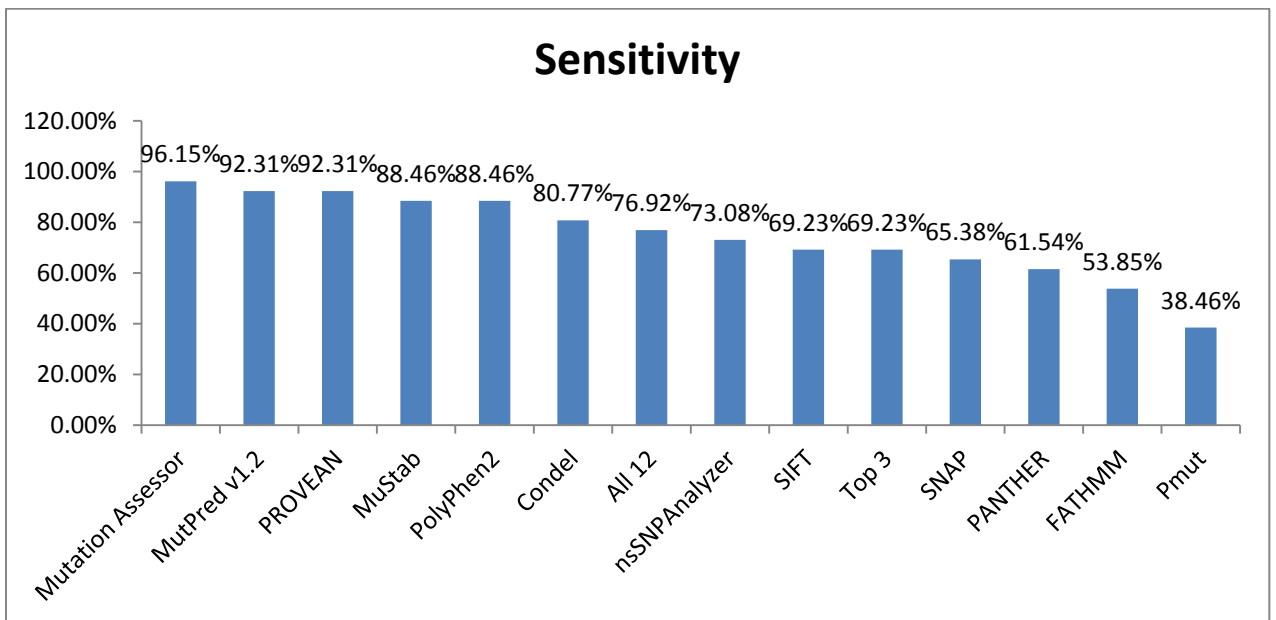


Figure 25: Sensitivity scores for 2012-2014 dataset

Sensitivity scores were in a narrower range for this dataset than the other dataset
 2012-2014 dataset represents mutations that were not included in the training datasets

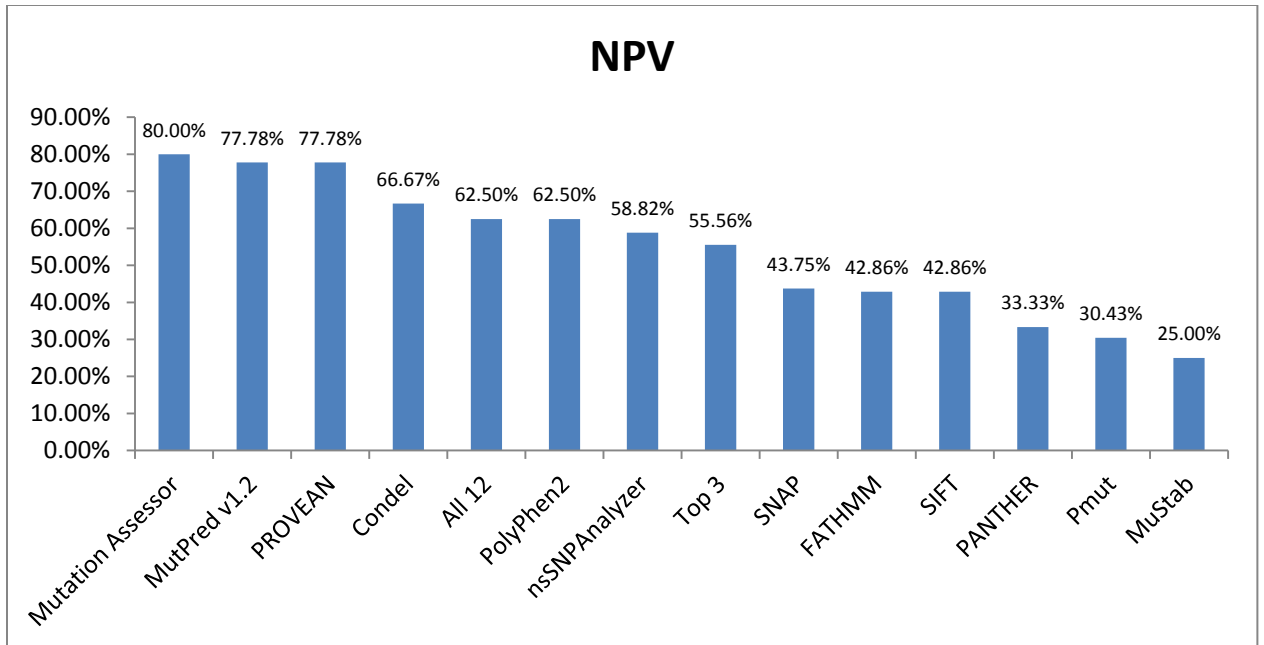


Figure 26: NPV scores for 2012-2014 dataset

NPV high scores averaged 25% lower for this dataset than the other dataset
 2012-2014 dataset represents mutations that were not included in the training datasets

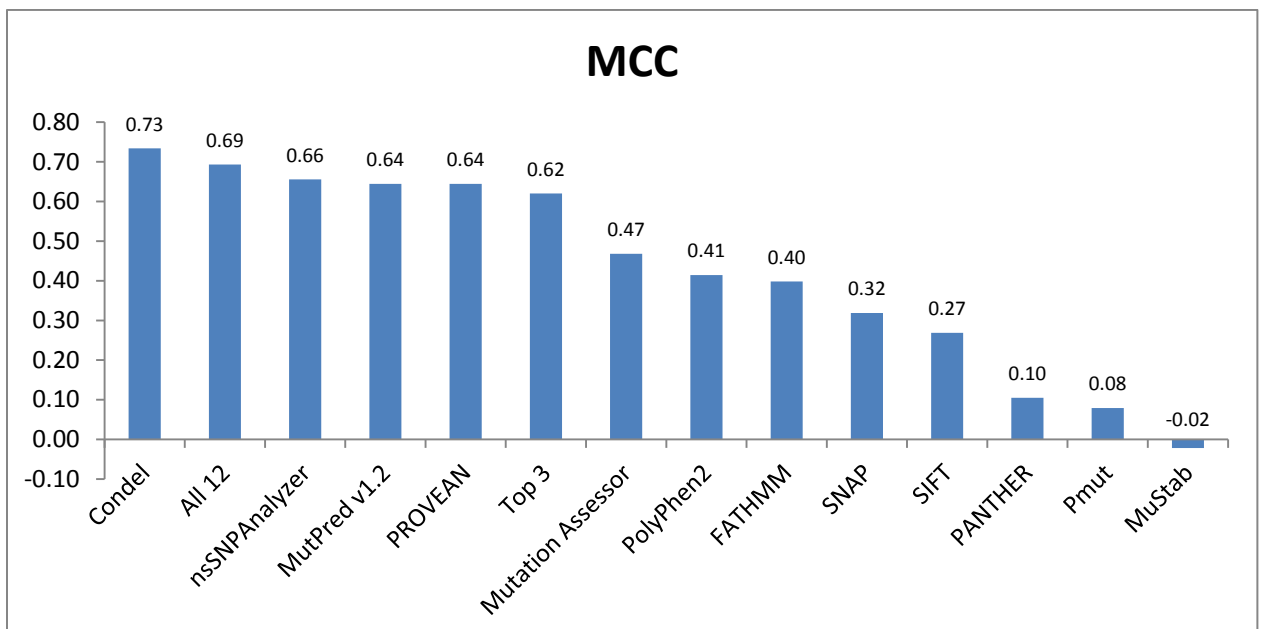


Figure 27: MCC scores for 2012-2014 dataset

MCC high scores averaged 15% lower for this dataset than the other dataset
 2012-2014 dataset represents mutations that were not included in the training datasets

Table 13: In silico method scores for the six measurements for dataset 2012-2014

In Silico Method	tn ¹	tp ²	fn ³	fp ⁴	Accuracy	Precision	Specificity	Sensitivity	NPV	MCC
Condel	10	21	5	0	86.11%	100.00%	100.00%	80.77%	66.67%	0.73
FATHMM	9	14	12	1	63.89%	93.33%	90.00%	53.85%	42.86%	0.40
MuStab	1	23	3	9	66.67%	71.88%	10.00%	88.46%	25.00%	-0.02
Mutation Assessor	4	25	1	6	80.56%	80.65%	40.00%	96.15%	80.00%	0.47
MutPred v1.2	7	24	2	3	86.11%	88.89%	70.00%	92.31%	77.78%	0.64
nsSNPAnalyzer	10	19	7	0	80.56%	100.00%	100.00%	73.08%	58.82%	0.66
PANTHER	5	16	10	5	58.33%	76.19%	50.00%	61.54%	33.33%	0.10
PMut	7	10	16	3	47.22%	76.92%	70.00%	38.46%	30.43%	0.08
PolyPhen-2	5	23	3	5	77.78%	82.14%	50.00%	88.46%	62.50%	0.41
PROVEAN	7	24	2	3	86.11%	88.89%	70.00%	92.31%	77.78%	0.64
SIFT	6	18	8	4	66.67%	81.82%	60.00%	69.23%	42.86%	0.27
SNAP	7	17	9	3	66.67%	85.00%	70.00%	65.38%	43.75%	0.32
Top 3 ⁵	10	18	8	0	77.78%	100.00%	100.00%	69.23%	55.56%	0.62
All 12 ⁶	10	20	6	0	83.33%	100.00%	100.00%	76.92%	62.50%	0.69
Expected values	10	26	0	0						

¹ tn = true negative

² tp = true positive

³ fn = false negative

⁴ fp = false positive

⁵ Top 3 are Condel, MutPred and nsSNPAnalyzer, unanimity considered deleterious

⁶ All 12 is all 12 packages with at least 8/12 predicting deleterious before considered deleterious

Three in silico methods consistently ranked highest, if not always in the same order, for both datasets: Condel, MutPred and nsSNPAnalyzer. PROVEAN tied for first on accuracy with Condel and MutPred on dataset 2012-2014 (86.11%), however, it did not place first on any other measurement on either of the two datasets so is not considered one of the top methods. Radar diagrams of the top three methods by measurement for each dataset (Figure 28 and Figure 29) show that MutPred is stronger at predicting deleterious mutations that could have been part of its training dataset while Condel and nsSNPAnalyzer are better at predicting neutral mutations.

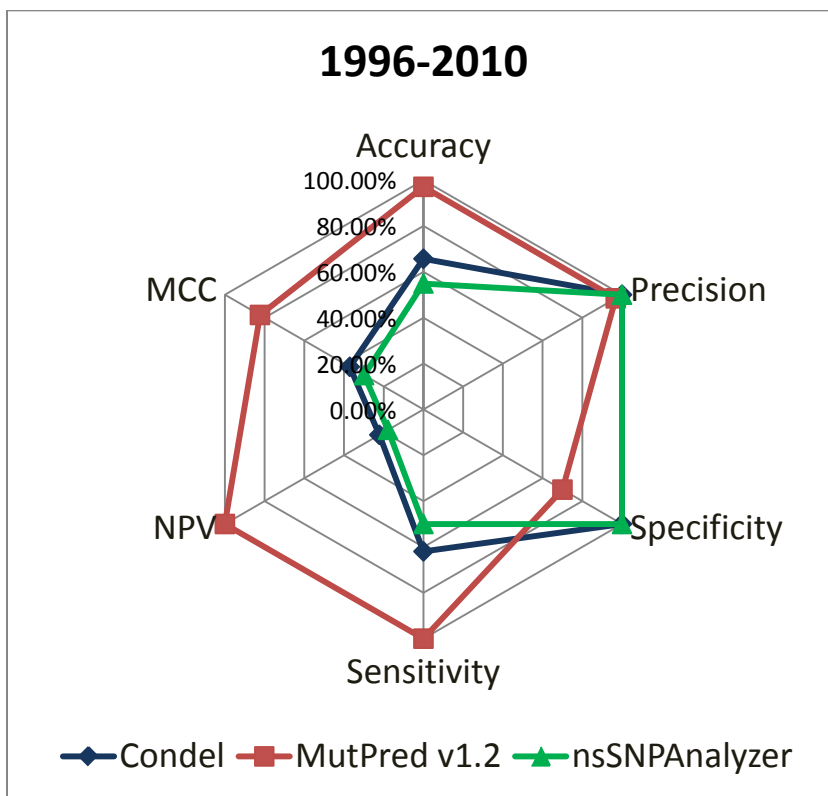


Figure 28: Top 3 in silico method results for dataset 1996-2010

MutPred results generally stronger than Condel and nsSNPAnalyzer on mutations that could have been part of its training dataset.

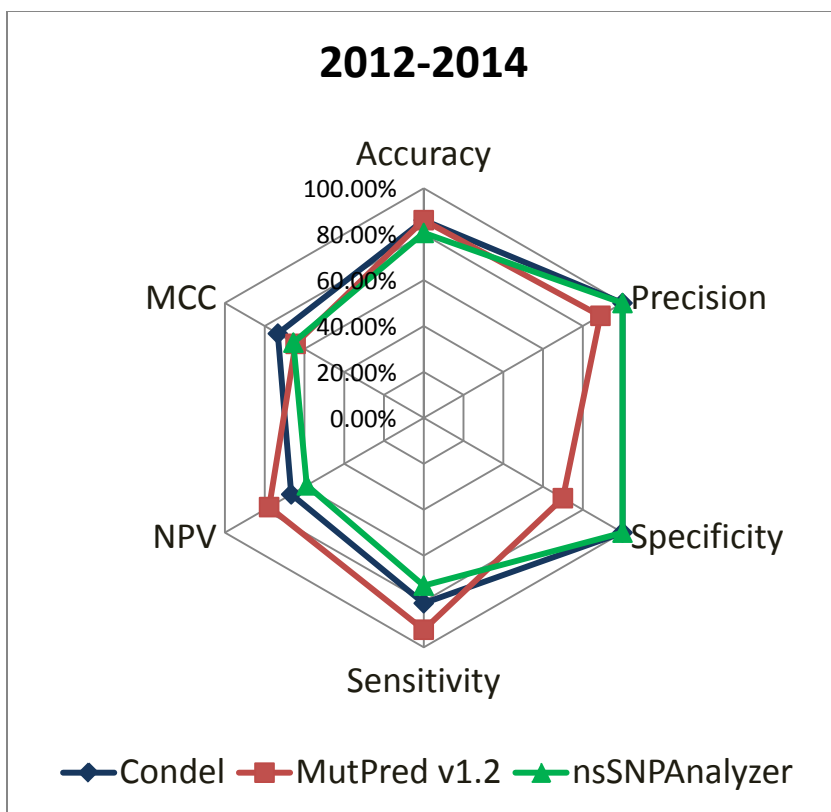


Figure 29: Top 3 in silico method results for dataset 2012-2014

MutPred performance closer to Condel and nsSNPAnalyzer on mutations that could not have been part of its training dataset.

MutPred is the only method that consistently scored in the top three positions on both datasets. MutPred scored first on four of the measurements for the 1996-2010 dataset. It did not do as well on the 2012-2014 dataset, only scoring first on two of the measurements, however, the lowest ranking it received on any dataset was third (Figure 34). Condel scored best on the 2012-2014 dataset, ranking first on four of the measurements (accuracy, precision, specificity and sensitivity). Results for the 1996-2010 ranked from first (precision and specificity) to seventh (sensitivity) (Figure 30). nsSNPAnalyzer rankings ranged from first (precision and specificity) to tenth (sensitivity) on dataset 1996-

2010, and from first (precision and specificity) to fifth (sensitivity and NPV) on dataset 2012-2014.

Four in silico methods consistently ranked lowest: MuStab, PANTHER, PMut and SIFT. Relative rankings for all methods are presented in graphical form in Figure 30, Figure 31, Figure 32, Figure 33, Figure 34, Figure 35, Figure 36, Figure 37, Figure 38, Figure 39, Figure 40, and Figure 41, and in tabular format in Table 14 and Table 15.

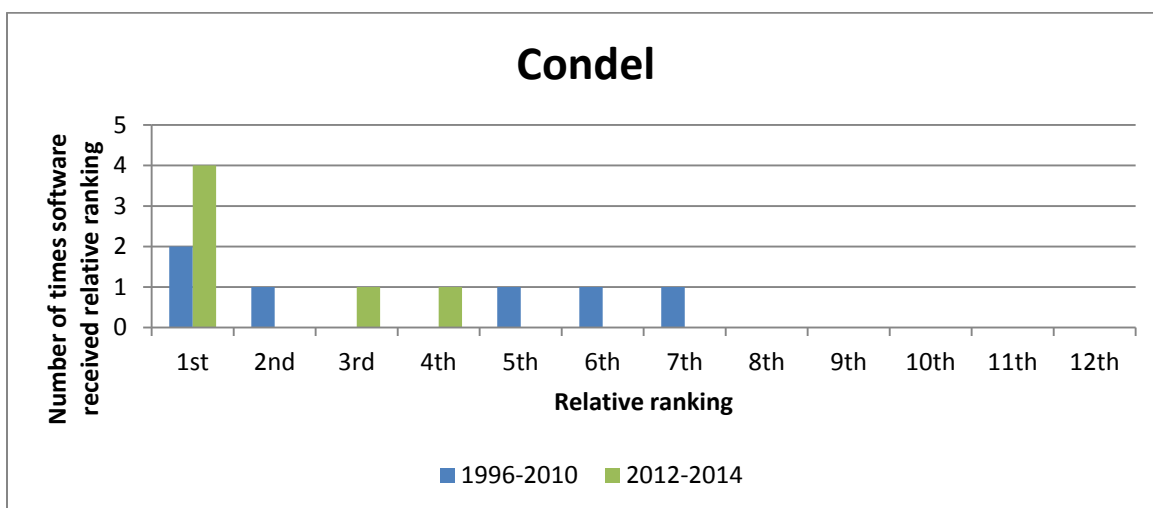


Figure 30: Condel relative rankings for both datasets

Condel relative rankings for each of the three datasets show it performed best on the 2012-2014 dataset.

1996-2010 dataset represents mutations that might be included in training datasets

2012-2014 dataset represents mutations that were not included in the training datasets

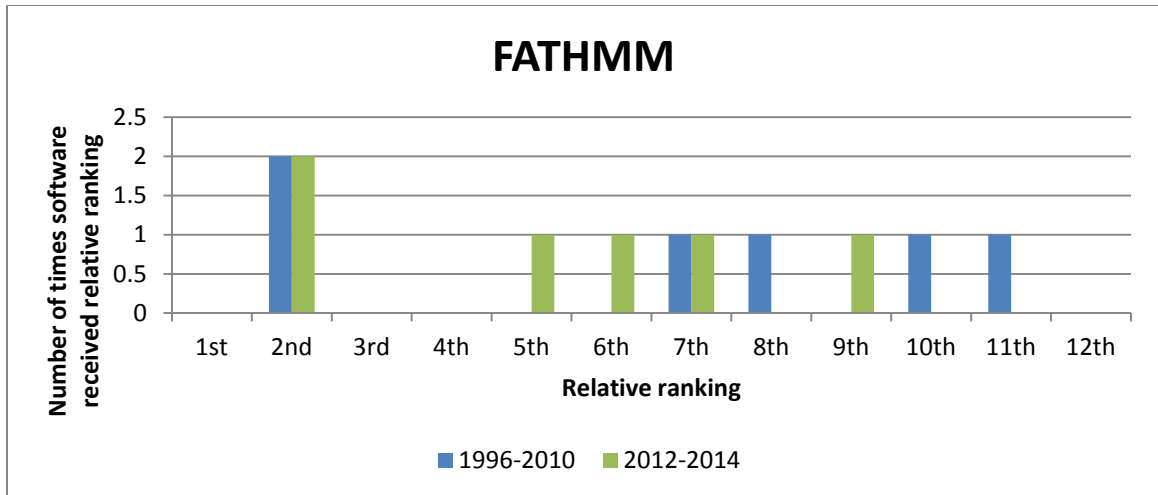


Figure 31: FATHMM relative rankings for both datasets

FATHMM relative rankings show a wide range for all datasets.

1996-2010 dataset represents mutations that might be included in training datasets

2012-2014 dataset represents mutations that were not included in the training datasets

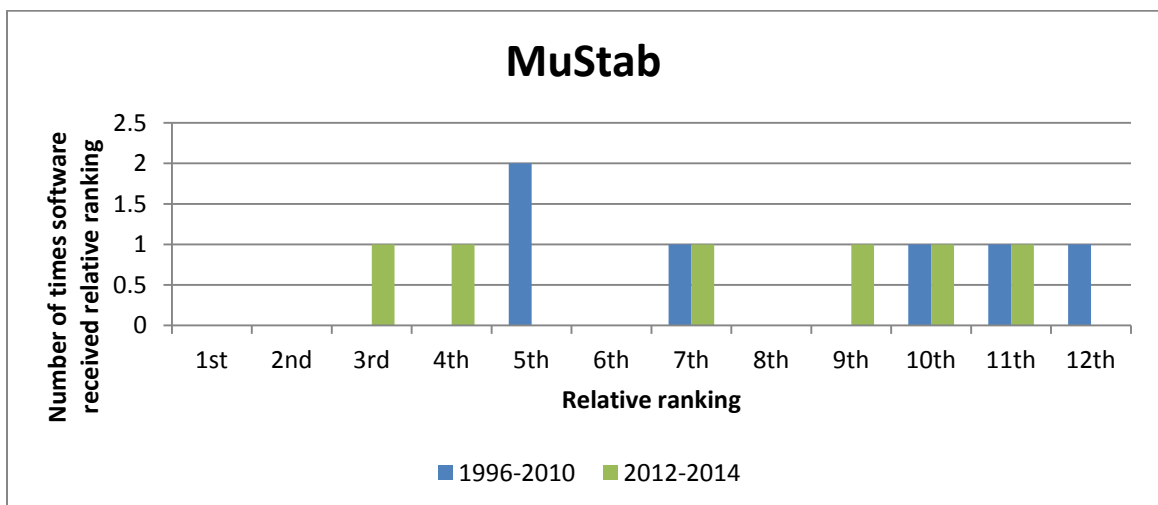


Figure 32: MuStab relative rankings for both datasets

MuStab relative rankings are never above fourth place.

1996-2010 dataset represents mutations that might be included in training datasets

2012-2014 dataset represents mutations that were not included in the training datasets

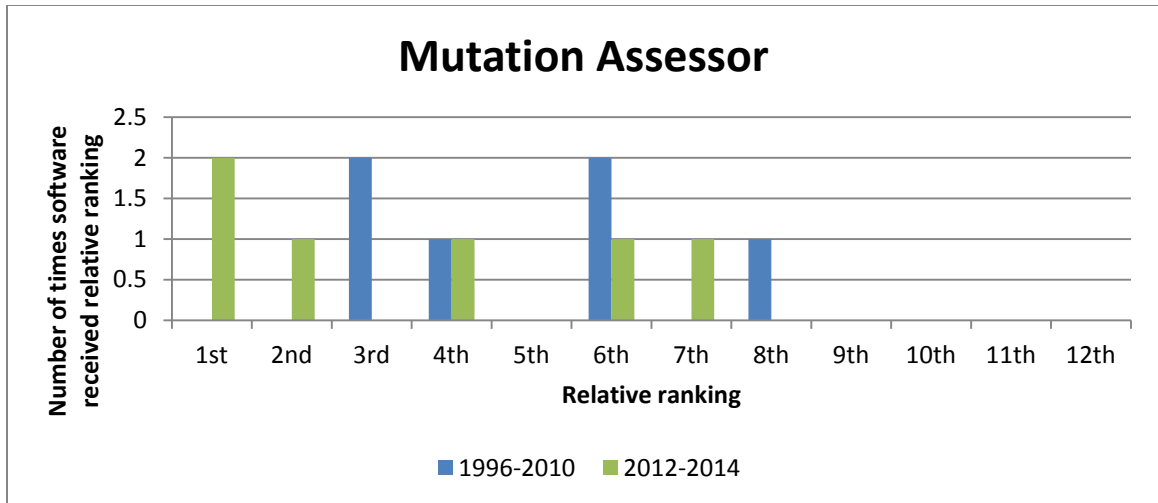


Figure 33: Mutation Assessor relative rankings for both datasets

Mutation Assessor rankings widest for 2012-2014 and narrowest for 1996-1997. 1996-2010 dataset represents mutations that might be included in training datasets 2012-2014 dataset represents mutations that were not included in the training datasets

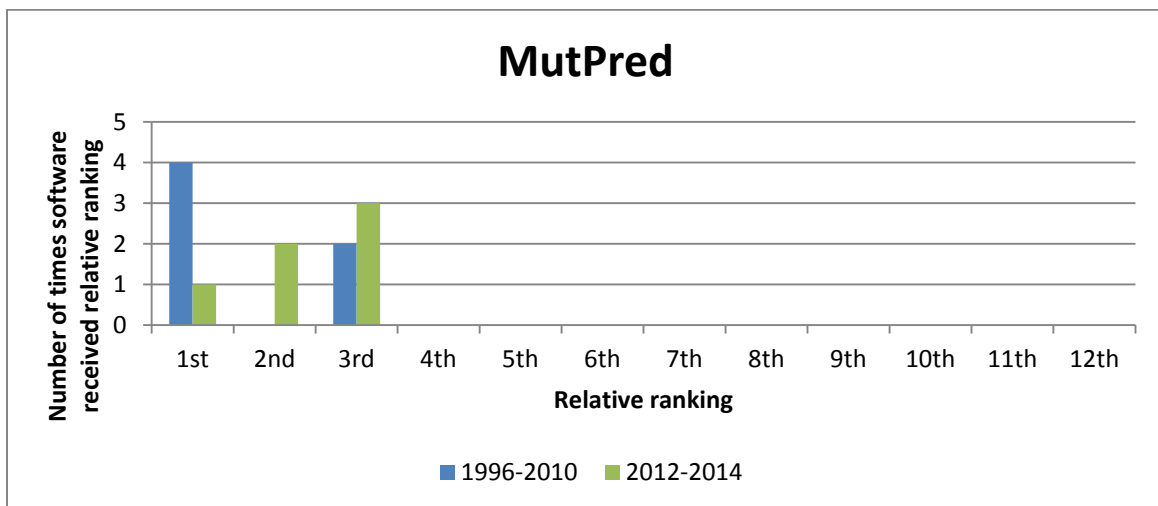


Figure 34: MutPred relative rankings for both datasets

MutPred relative rankings are always grouped in first to third position. 1996-2010 dataset represents mutations that might be included in training datasets 2012-2014 dataset represents mutations that were not included in the training datasets

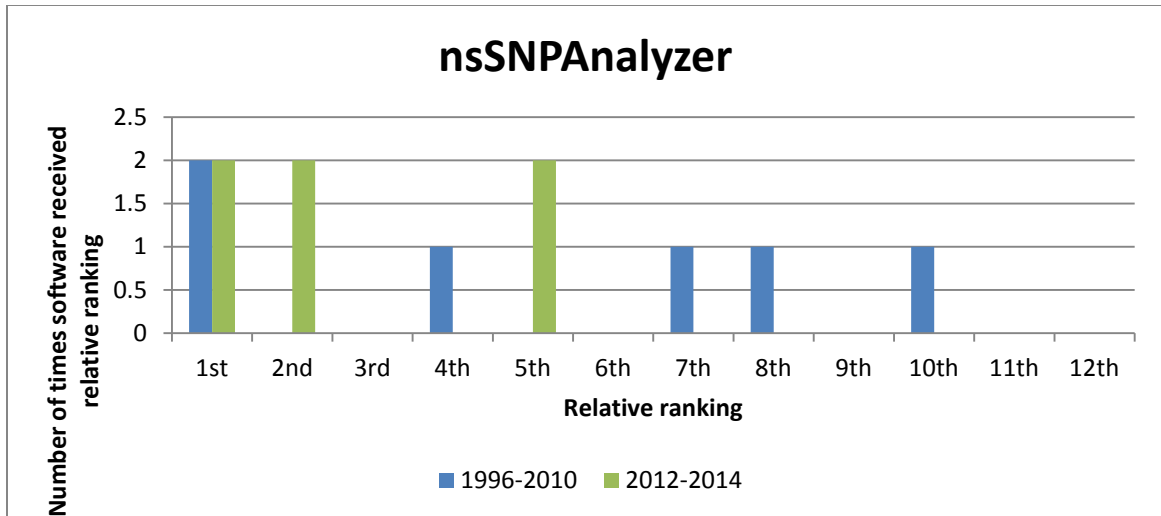


Figure 35: nsSNPAnalyzer relative rankings for both datasets

nsSNPAnalyzer relative rankings range from first to 10th position.

1996-2010 dataset represents mutations that might be included in training datasets

2012-2014 dataset represents mutations that were not included in the training datasets

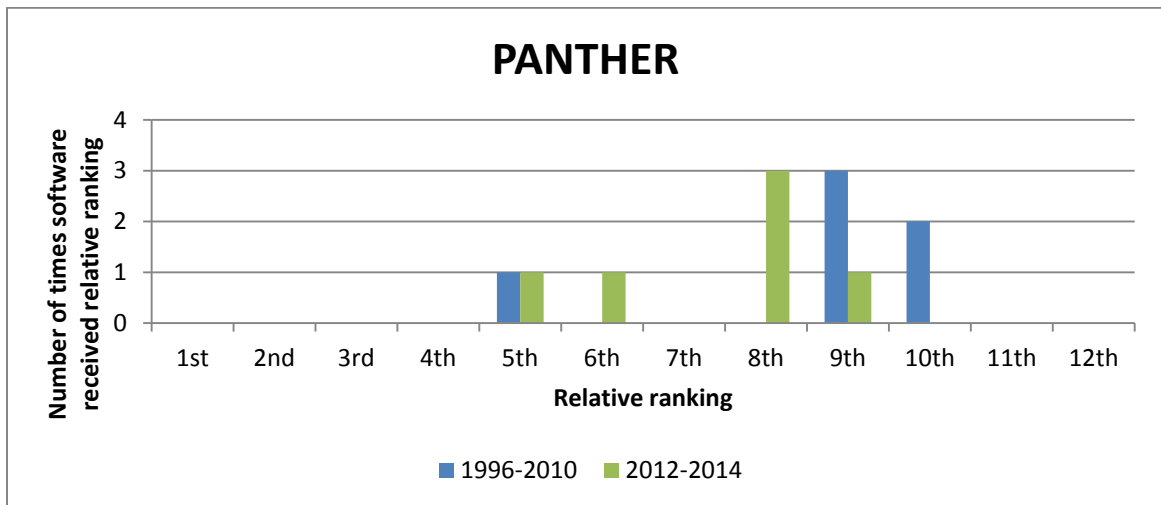


Figure 36: PANTHER relative rankings for both datasets

PANTHER relative rankings range from sixth to 12th position.

1996-2010 dataset represents mutations that might be included in training datasets

2012-2014 dataset represents mutations that were not included in the training datasets

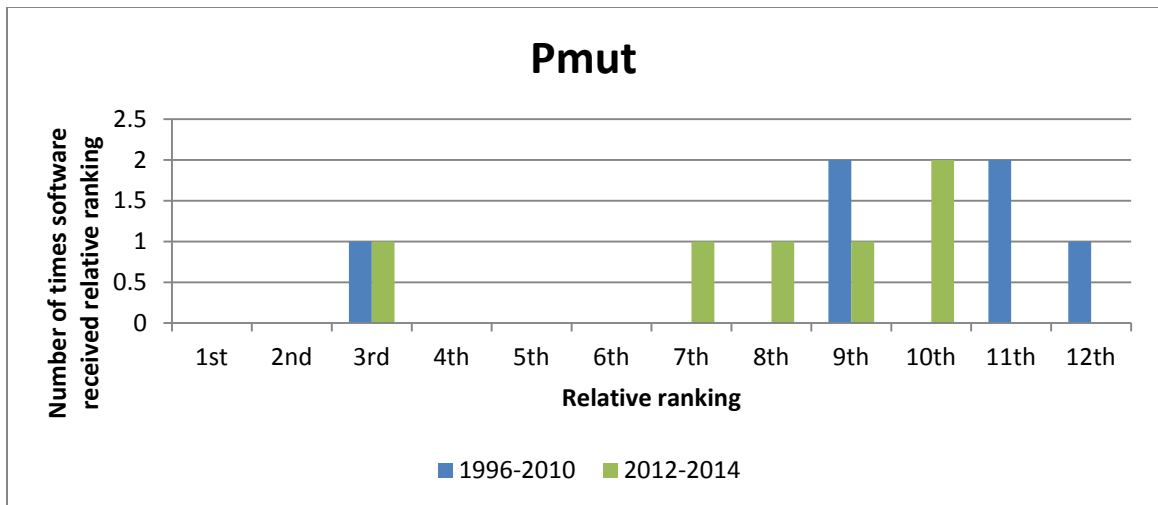


Figure 37: PMut relative rankings for both datasets

PMut relative rankings ranged from third to 12th position.

1996-2010 dataset represents mutations that might be included in training datasets

2012-2014 dataset represents mutations that were not included in the training datasets

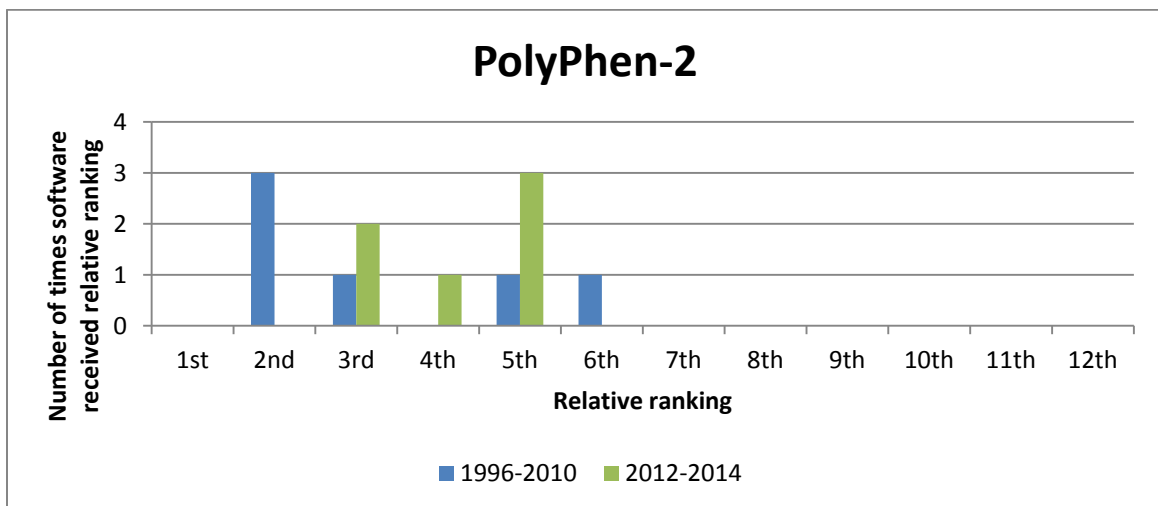


Figure 38: PolyPhen-2 relative rankings for both datasets

PolyPhen-2 relative rankings are higher for the earlier datasets than the later dataset.

1996-2010 dataset represents mutations that might be included in training datasets

2012-2014 dataset represents mutations that were not included in the training datasets

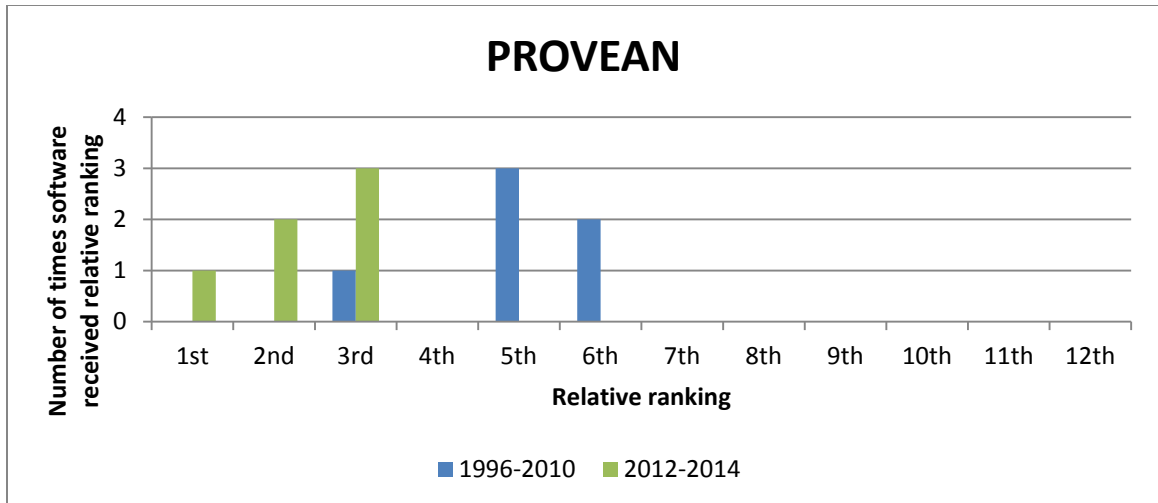


Figure 39: PROVEAN relative rankings for both datasets

PROVEAN relative rankings ranked lower for the 1996-1997 dataset.

1996-2010 dataset represents mutations that might be included in training datasets

2012-2014 dataset represents mutations that were not included in the training datasets

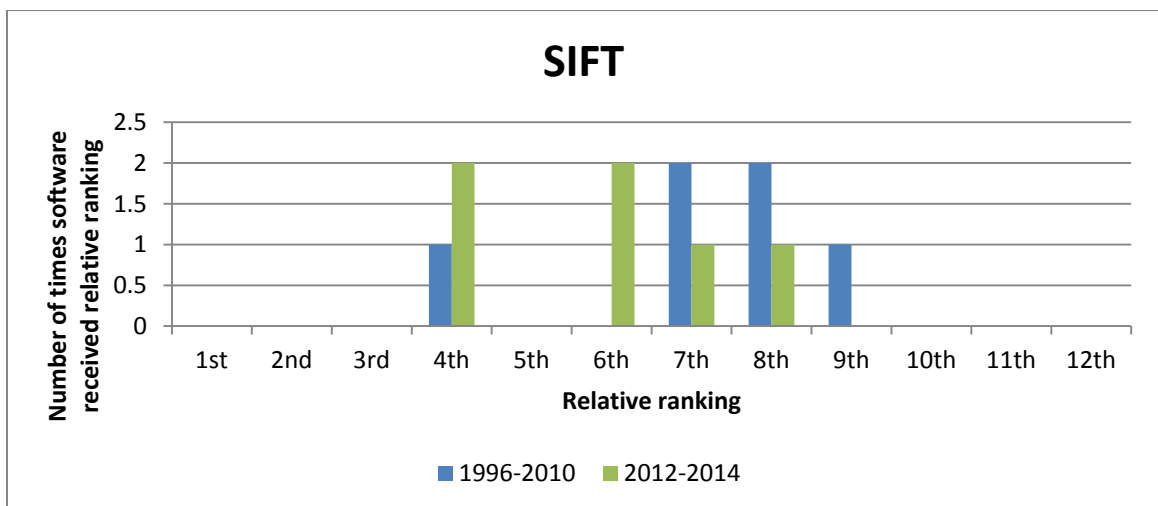


Figure 40: SIFT relative rankings for both datasets

SIFT relative rankings are ranked from fourth to 11th position.

1996-2010 dataset represents mutations that might be included in training datasets

2012-2014 dataset represents mutations that were not included in the training datasets

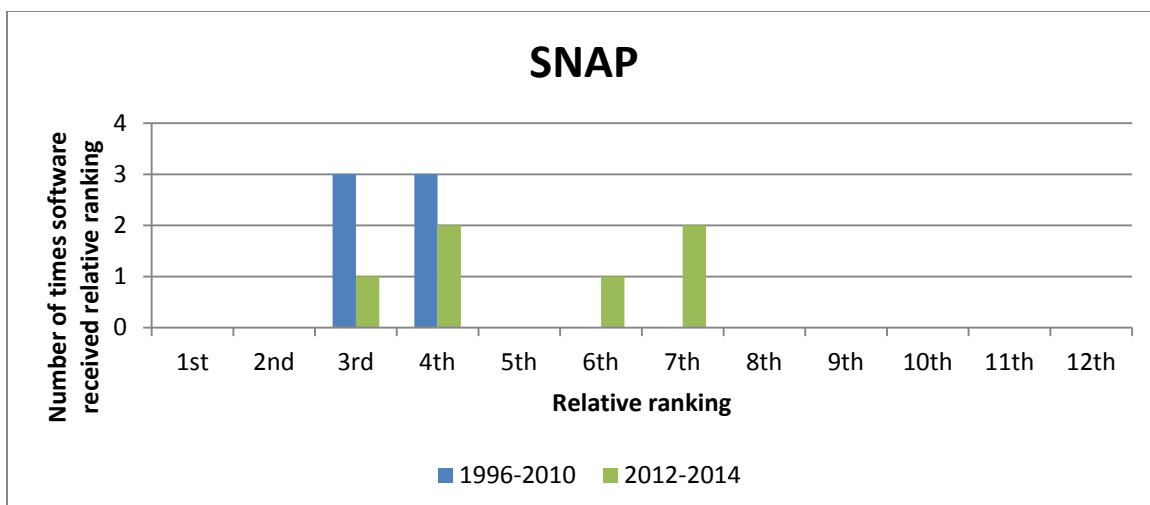


Figure 41: SNAP relative rankings for both datasets

SNAP relative rankings are tightest for 1996-2010 and scattered for the other datasets. 1996-2010 dataset represents mutations that might be included in training datasets. 2012-2014 dataset represents mutations that were not included in the training datasets.

Table 14: Individual measurement relative rankings for dataset 1996-2010

1996-2010	Accuracy	Precision	Specificity	Sensitivity	NPV	MCC
Condel	6	1	1	7	5	2
FATHMM	10	2	2	11	8	7
MuStab	5	11	7	5	12	10
Mutation Assessor	3	8	6	3	4	6
MutPred	1	3	3	1	1	1
nsSNPAnalyzer	8	1	1	10	7	4
PANTHER	9	10	5	9	10	9
PMut	11	9	3	12	11	9
PolyPhen-2	2	6	5	2	2	3
PROVEAN	5	5	3	6	6	5
SIFT	7	7	4	8	9	8
SNAP	4	4	3	4	3	3

Table 15: Individual measurement relative rankings for dataset 2012-2014

2012-2014	Accuracy	Precision	Specificity	Sensitivity	NPV	MCC
Condel	1	1	1	4	3	1
FATHMM	5	2	2	9	7	6
MuStab	4	9	7	3	10	11
Mutation Assessor	2	7	6	1	1	4
MutPred	1	3	3	2	2	3
nsSNPAnalyzer	2	1	1	5	5	2
PANTHER	6	8	5	8	8	9
PMut	7	8	3	10	9	10
PolyPhen-2	3	5	5	3	4	5
PROVEAN	1	3	3	2	2	3
SIFT	4	6	4	6	7	8
SNAP	4	4	3	7	6	7

DISCUSSION AND CONCLUSION

This study evaluated the ability of select publicly available in silico methods to predict the effect of mutations not included in their training datasets by leveraging published mutations from 2012 to 2014 and unreported mutations for which activity was determined based on an enzyme activity assay.

Enzyme activity conclusions

Forty-six of the 47 missense mutations created and assayed showed non-processed 55 kDa bands, indicating the mutations were synthesizing protein. The one mutation that didn't produce a 55 kDa band in repeated western blots

(A27T) still showed enzyme activity of 4.13%, which is higher than the activity of 12 other assayed mutations (G47R, G50V, Q111R, I113F, G116V, G155R, P125L, G139S, F167V, N204K, R386C, and M494V). A27T also didn't show bands at 40 and 15 kDa subunit level, which means the lack of a 55 kDa band cannot be due to the mutant being processed into the subunits faster than other mutants. Further testing on A27T is necessary in order to determine the cause of its unusual behavior and will offer new insights into how this mutation impacts the function of GALNS.

Results from the western blot analysis indicate the mutants are producing protein, as denoted by the 55 kDa band. The protein should then be transported to the lysosome and processed into 40 and 15 kDa subunits (Masue 1991 *J.Biochem.*), however, mutants with reduced activity relative to wild-type show lighter or non-detectable 40 and 15 kDa bands. Reduced appearance of the 40 and 15 kDa subunits is consistent with the hypothesis that the proteins are not properly folding after synthesis and subsequently degraded prior to lysosomal transport.

Four mutations (G50V, G421E, N423K, and F452I) were selected for testing because of their potential to impact dimerization, in an effort to determine whether dimerization is important for GALNS activity. Three of the mutations (G50V, G421E, and F452I) showed significantly reduced activity (3.86%, 5.67% and 19.19%, respectively), which one (N423K) did not (51.41%). The potential dimerization impact of N423K is indirect by negatively impacting glycosylation, so a wild-type activity levels are not necessarily indicative that dimerization is not

necessary. Overall, these values justify further evaluation of the potential effect of protein dimerization.

Overall, the enzyme activity results indicate the assay may be used to differentiate levels of enzyme activity ranging from significantly reduced to wild-type levels. The assay produced a wide-range of values for mutations reported as mild, which is more likely due to the lack of a standard methodology used when diagnosing Morquio A severity given the results for each mutation were internally consistent. The enzyme activity assay produced results within the expected range for 11 of the 13 severe and intermediate reported mutations assayed. While the other two mutations (R376Q and M391V) might indicate a problem with the assay, however, given that the other 11 mutations results were so consistent, it is more likely that there is some other explanation for the observed discrepancy.

One potential explanation for the differences in the reported phenotype and assay values for R376Q and M391V may be the presence of missed deletions and/or mutations such as rearrangements. Missed mutations (e.g., by allele drop-out) are possible if the samples were very small or degraded. Documented instances exist of a missed Morquio A mutation incorrectly leading to assessment of wild-type when in fact the individual was a heterozygous carrier (Qubbaj 2008 *Prenat.Diagn.*). Testing for deletions and rearrangements is infrequently performed, making the possibility of not identifying them a distinct possibility.

Another possible explanation is the lack of a clear, agreed upon standard for defining whether the disease is mild, intermediate or severe. A number of physical characteristics are assessed to make the determination, so there is the potential for a high degree of variability between assessors. In order to standardize disease severity assessments, it is important that a common standard be adopted, such as the one proposed by Wood et al in 2013.

There is also the possibility that other confounding factors exist, such as mutations in promoter or other regulatory regions for the gene or environmental factors that might have an effect. Studying polymorphisms in the promoter region or other regulatory regions for the gene would help determine whether there are polymorphisms that increase or decrease the transcription of *GALNS*. Further, this would enable discovery of the pathways involved in regulating *GALNS* transcription. Pathway(s) identification is foundational to determining whether environmental factors affect the course of the disease.

In silico methods analysis

Precision and NPV can only be used to evaluate methods if one of two conditions are met: 1) the same datasets are used to evaluate all in silico methods, or 2) different datasets are normalized so that the ratio of deleterious and neutral mutations are the same across in silico methods. This study used the same datasets for all in silico method testing so normalization was not required. The datasets in this study had a higher ratio of deleterious to neutral mutations so precision will appear lower and NPV higher than if the datasets contained the

same ratio, however, since the same datasets were used for all methods, the results relative to each other remain valid.

Of the 12 packages evaluated, MutPred was the only in silico method that consistently placed in the top three. It is possible that MutPred scored highest on the 1996-2010 dataset because its training datasets included the Human Gene Mutation Database (HGMD), which incorporates reported Morquio A mutations. Another possibility is the algorithm on which MutPred is based (Random Forest, which a Bayesian rule variant) as nsSNPAnalyzer is also based on Random Forest and it ranked third overall. The algorithm used by MutPred, combined with the fact that it evaluates more factors than any other method when making its assessment, is the most likely explanation for its ranking.

Interestingly, Condel performed best on the dataset that was most likely not part of its training dataset (2012-2014). Condel uses a weighted average score of results from five other methods (LogR Pfam E-value, MAPP, Mutation Assessor, PolyPhen-2, and SIFT). Three of the five packages (Mutation Assessor, PolyPhen-2 and SIFT) were evaluated as part of this study and their individual results do not explain why Condel performed as high as it did. Our combined results from the top three in silico methods also do not provide an explanation as they only increased the number of correctly predicted neutral mutations, where Condel already scored perfectly.

Condel was unable to generate a prediction for two deleterious mutations in the 2012-2014 dataset: S89P and R380G. The fact that Condel cannot make

predictions for mutations which can be created by a single nucleotide change casts doubt on its first place rank for this dataset.

Testing performed in 2011 ranked SNPs&GO and MutPred as first and second overall, however, MutPred received the highest score on only one of the measurements (Thusberg 2011 *Hum.Mutat.*). There are two likely explanations for MutPred performing better in this study. First, this study did not test SNPs&GO because their web-based interface does not support batch testing of mutations. Second, in version 1.2, MutPred replaced the portion of its algorithm that relied on SIFT with their own assessment of multiple factors. Based on the results of this study, the change appears to have improved overall prediction performance.

Work to establish a single, standardized measurement to evaluate results across in silico methods is warranted. The currently recommended six measurements do not provide consistent results. This study ranked the in silico methods across measurements relative to each other in an effort to determine which methods performed best overall, however, this method has the distinct disadvantage of masking the closeness of some of the measurement results. A method that gave a more complete picture would be of value for future evaluations.

Overall conclusion

In conclusion, the results indicate that 1) the enzyme activity assay developed has value in assessing mutations with severe or intermediate effect

but cannot be used to distinguish mild mutations from wild-type, 2) further in silico method development is warranted, and 3) establishing a single, standardized measurement to evaluate results across in silico methods would facilitate their evaluation. While some in silico methods did better (MutPred) and others fared badly (PANTHER), none of the methods should be used to make diagnostic conclusions for specific mutations. Enzyme activity testing is still required in order to understand the impact of any particular mutation.

Future studies

There are several areas of inquiry worth pursuing in the future encompassing many aspects of this study. Further evaluation of previously reported mutations documented as disease associated but which produce anomalous enzyme activity results is warranted. It would be particularly interesting if an *in vivo* model of some of the mutations could be developed to further study the impacts of the mutations. Specifically, R376Q (categorized as severe) and M391V (categorized as intermediate) which show activity levels close to wild-type in the enzyme activity assay, and N204K and E121D which were categorized as mild but show activity levels comparable with severe and intermediate forms of the disease, would benefit from more functional analysis with an *in vivo* model. The A27T mutant would also be interesting to explore as it is the only mutation that did not show a 55 kDa band on the western blot analysis. Additionally, producing mutations that cannot dimerize to determine whether monomers retain full functionality would also be interesting.

Most assays for GALNS enzyme activity have a wide range between high and low scores. It would be worth determining whether this is due to 1) transfection efficiency, 2) cell variability, 3) actual enzymatic activity variability based on test conditions, which might be more tightly controlled, 4) different mutations interacting with the analog used in enzyme activity testing differently than they do the actual substrate, 5) some mutations inherently exhibiting more variability than others, such as in half-life or clearance rates, 4) some mild forms being considered wild-type and/or 6) varying gene expressions levels. Some of these are easier to determine than others. Testing for transfection efficiency can be determined with standard testing procedures. Tight control of testing conditions and modifying single variables to determine correlated changes is also well-understood. Examples of mutations that might be tested with lower variability are M41L (mild) and T200M (neutral) and those with higher variability are F284V (mild) and A459V (neutral). Other tests would be more challenging. Assessing whether some mutations inherently exhibit more variability than others would require determining the half-life of the wild-type and respective mutations as well as a deeper understanding of the mechanism(s) for breaking down and clearing GALNS. Determining whether some mild forms of the disease are being categorized as wild-type (entirely possible given there are documented instances of very mild forms which were not identified until after the birth of a child(ren) presenting a more severe form of the disease (Bunge 1997 *Hum.Mutat.*), requires the adoption of a standard mechanism for Morquio A disease diagnosis. A standard has been proposed (Wood 2013 *J.Inherit.Metab Dis.*) that would

facilitate future diagnosis being standardized, however, it cannot be leveraged to bring previous reports into line with the new methodology. This makes re-evaluation of previously reported mutation phenotype associations necessary as new reports of the same mutation using the standard proposed become available. Evaluating whether varying expression levels are implicated in the disease would require determining the expression ranges for various cell types, the range of values associated with a normal phenotype, and the expression levels in a sufficient number of people with Morquio A to ascertain whether there is a correlation

Further refinement of the enzyme activity assay would also be beneficial, particularly in terms of defining ranges for categorizing mutations as severe, mild or neutral.

Exploring genetic areas outside the scope of this study would be interesting. In addition to exploring the effects of mutations on the promoter and other regulatory regions, as discussed above, exploration of splice site mutations and mutations that alter more than one nucleotide would also be valuable. Wang 2010 reported a splice site mutation that destroys exon 5 and a double nucleotide mutation that produces G168L (c.502_503GG>>TT). Other splice site mutations have been reported, however, they were not collected as part of this study.

Another potential area for study is to determine whether there is a difference in each method's predictive ability based on the mutation location in the protein. Of the 200 reported mutations, 118 have been classified by mutation

location: 77 as buried, 32 as surface, 6 as active site, and 3 as processing. Not all of these mutations are disease associated or likely disease associated, further reducing the number that can be used for evaluation purposes. As more disease associated and likely disease associated mutations in the active site and processing categories become identified, it will become possible to assess whether some methods are better than others at predicting mutations effects in certain portions of the enzyme.

Further evaluation of the in silico methods would also be interesting. One possibility is evaluating MutPred v1.2 and SNPs&GO on the same dataset (preferably the one used in this study to reduce variability) in order to answer the question regarding whether MutPred v1.2 (which removed SIFT from its algorithm) increased its predictive ability compared to SNPs&GO (Thusberg 2011 *Hum.Mutat.*). Another possibility is generating a larger dataset with an equal number of deleterious and neutral mutations and repeating the testing of the in silico methods. The datasets used in this study were small and a larger dataset would reduce the risk as well as determine whether the results were reproducible.

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Appendix 1: GALNS Protein Mutation Dataset

Note: This dataset excludes synonymous and terminating protein mutations.

M1A;M1C;M1D;M1E;M1F;M1G;M1H;M1I;M1K;M1L;M1N;M1P;M1Q;M1R;M1S;M1T;M1V;M1W;M1Y;A2C;A2D;A2E;A2F;A2G;A2H;A2I;A2K;A2L;A2M;A2N;A2P;A2Q;A2R;A2S;A2T;A2V;A2W;A2Y;A3C;A3D;A3E;A3F;A3G;A3H;A3I;A3K;A3L;A3M;A3N;A3P;A3Q;A3R;A3S;A3T;A3V;A3W;A3Y;V4A;V4C;V4D;V4E;V4F;V4G;V4H;V4I;V4K;V4L;V4M;V4N;V4P;V4Q;V4R;V4S;V4T;V4W;V4Y;V5A;V5C;V5D;V5E;V5F;V5G;V5H;V5I;V5K;V5L;V5M;V5N;V5P;V5Q;V5R;V5S;V5T;V5W;V5Y;A6C;A6D;A6E;A6F;A6G;A6H;A6I;A6K;A6L;A6M;A6N;A6P;A6Q;A6R;A6S;A6T;A6V;A6W;A6Y;A7C;A7D;A7E;A7F;A7G;A7H;A7I;A7K;A7L;A7M;A7N;A7P;A7Q;A7R;A7S;A7T;A7V;A7W;A7Y;T8A;T8C;T8D;T8E;T8F;T8G;T8H;T8I;T8K;T8L;T8M;T8N;T8P;T8Q;T8R;T8S;T8V;T8W;T8Y;R9A;R9C;R9D;R9E;R9F;R9G;R9H;R9I;R9K;R9L;R9M;R9N;R9P;R9Q;R9S;R9T;R9V;R9W;R9Y;W10A;W10C;W10D;W10E;W10F;W10G;W10H;W10I;W10K;W10L;W10M;W10N;W10P;W10Q;W10R;W10S;W10T;W10V;W10Y;W11A;W11C;W11D;W11E;W11F;W11G;W11H;W11I;W11K;W11L;W11M;W11N;W11P;W11Q;W11R;W11S;W11T;W11V;W11Y;Q12A;Q12C;Q12D;Q12E;Q12F;Q12G;Q12H;Q12I;Q12K;Q12L;Q12M;Q12N;Q12P;Q12R;Q12S;Q12T;Q12V;Q12W;Q12Y;L13A;L13C;L13D;L13E;L13F;L13G;L13H;L13I;L13K;L13M;L13N;L13P;L13Q;L13R;L13S;L13T;L13V;L13W;L13Y;L14A;L14C;L14D;L14E;L14F;L14G;L14H;L14I;L14K;L14M;L14N;L14P;L14Q;L14R;L14S;L14T;L14V;L14W;L14Y;L15A;L15C;L15D;L15E;L15F;L15G;L15H;L15I;L15K;L15M;L15N;L15P;L15Q;L15R;L15S;L15T;L15V;L15W;L15Y;V16A;V16C;V16D;V16E;V16F;V16G;V16H;V16I;V16K;V16L;V16M;V16N;V16P;V16Q;V16R;V16S;V16T;V16W;V16Y;L17A;L17C;L17D;L17E;L17F;L17G;L17H;L17I;L17K;L17M;L17N;L17P;L17Q;L17R;L17S;L17T;L17V;L17W;L17Y;S18A;S18C;S18D;S18E;S18F;S18G;S18H;S18I;S18K;S18L;S18M;S18N;S18P;S18Q;S18R;S18T;S18V;S18W;S18Y;A19C;A19D;A19E;A19F;A19G;A19H;A19I;A19K;A19L;A19M;A19N;A19P;A19Q;A19R;A19S;A19T;A19V;A19W;A19Y;A20C;A20D;A20E;A20F;A20G;A20H;A20I;A20K;A20L;A20M;A20N;A20P;A20Q;A20R;A20S;A20T;A20V;A20W;A20Y;G21A;G21C;G21D;G21E;G21F;G21H;G21I;G21K;G21L;G21M;G21N;G21P;G21Q;G21R;G21S;G21T;G21V;G21W;G21Y;M22A;M22C;M22D;M22E;M22F;M22G;M22H;M22I;M22K;M22L;M22N;M22P;M22Q;M22R;M22S;M22T;M22V;M22W;M22Y;G23A;G23C;G23D;G23E;G23F;G23H;G23I;G23K;G23L;G23M;G23N;G23P;G23Q;G23R;G23S;G23T;G23V;G23W;G23Y;A24C;A24D;A24E;A24F;A24G;A24H;A24I;A24K;A24L;A24M;A24N;A24P;A24Q;A24R;A24S;A24T;A24V;A24W;A24Y;S25A;S25C;S25D;S25E;S25F;S25G;S25H;S25I;S25K;S25L;S25M;S25N;S25P;S25Q;S25R;S25T;S25V;S25W;S25Y;G26A;G26C;G26D;G26E;G26F;G26H;G26I;G26K;G26L;G26M;G26N;G26P;G26Q;G26R;G26S;G26T;G26V;G26W;G26Y;A27C;A27D;A27E;A27F;A27G;A27H;A27I;A27K;A27L;A27M;A27N;A27P;A27Q;A27R;A27S;A27T;A27V;A27W;A27Y;P28A;P28C;P28D;P28E;P28F;P28G;P28H;P28I;P28K;P28L;P28M;P28N;P28Q;P28R;P28S;P28T;P28V;P28W;P28Y;Q29A;Q29C;Q29D;Q29E;Q29F;Q29G;Q29H;Q29I;Q29K;Q29L;Q29M;Q29N;Q29P;Q29R;Q29S;Q29T;Q29V;Q29W;Q29Y;P30A;P30C;P30D;P30E;P30F;P30G;P30H;P30I;P30K;P30L;P30M;P30N;P30Q;P30R;P30S;P30T;P30V;P30W;P30Y;P31A;P31C;P31D;P31E;P31F;P31G;P31H;P31I;P31K;P31L;P31M;P31N;P31Q;P31R;P31S;P31T;P31V;

P31W;P31Y;N32A;N32C;N32D;N32E;N32F;N32G;N32H;N32I;N32K;N32L;N32M
;N32P;N32Q;N32R;N32S;N32T;N32V;N32W;N32Y;I33A;I33C;I33D;I33E;I33F;I3
3G;I33H;I33K;I33L;I33M;I33N;I33P;I33Q;I33R;I33S;I33T;I33V;I33W;I33Y;L34A;L
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;L34T;L34V;L34W;L34Y;L35A;L35C;L35D;L35E;L35F;L35G;L35H;L35I;L35K;L35
M;L35N;L35P;L35Q;L35R;L35S;L35T;L35V;L35W;L35Y;L36A;L36C;L36D;L36E;
L36F;L36G;L36H;L36I;L36K;L36M;L36N;L36P;L36Q;L36R;L36S;L36T;L36V;L36
W;L36Y;L37A;L37C;L37D;L37E;L37F;L37G;L37H;L37I;L37K;L37M;L37N;L37P;L
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M38H;M38I;M38K;M38L;M38N;M38P;M38Q;M38R;M38S;M38T;M38V;M38W;M
38Y;D39A;D39C;D39E;D39F;D39G;D39H;D39I;D39K;D39L;D39M;D39N;D39P;
D39Q;D39R;D39S;D39T;D39V;D39W;D39Y;D40A;D40C;D40E;D40F;D40G;D40
H;D40I;D40K;D40L;D40M;D40N;D40P;D40Q;D40R;D40S;D40T;D40V;D40W;D4
0Y;M41A;M41C;M41D;M41E;M41F;M41G;M41H;M41I;M41K;M41L;M41N;M41P;
M41Q;M41R;M41S;M41T;M41V;M41W;M41Y;G42A;G42C;G42D;G42E;G42F;G
42H;G42I;G42K;G42L;G42M;G42N;G42P;G42Q;G42R;G42S;G42T;G42V;G42W
;G42Y;W43A;W43C;W43D;W43E;W43F;W43G;W43H;W43I;W43K;W43L;W43M
;W43N;W43P;W43Q;W43R;W43S;W43T;W43V;W43Y;G44A;G44C;G44D;G44E;
G44F;G44H;G44I;G44K;G44L;G44M;G44N;G44P;G44Q;G44R;G44S;G44T;G44
V;G44W;G44Y;D45A;D45C;D45E;D45F;D45G;D45H;D45I;D45K;D45L;D45M;D4
5N;D45P;D45Q;D45R;D45S;D45T;D45V;D45W;D45Y;L46A;L46C;L46D;L46E;L4
6F;L46G;L46H;L46I;L46K;L46M;L46N;L46P;L46Q;L46R;L46S;L46T;L46V;L46W;
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P;G47Q;G47R;G47S;G47T;G47V;G47W;G47Y;V48A;V48C;V48D;V48E;V48F;V
48G;V48H;V48I;V48K;V48L;V48M;V48N;V48P;V48Q;V48R;V48S;V48T;V48W;V
48Y;Y49A;Y49C;Y49D;Y49E;Y49F;Y49G;Y49H;Y49I;Y49K;Y49L;Y49M;Y49N;Y4
9P;Y49Q;Y49R;Y49S;Y49T;Y49V;Y49W;G50A;G50C;G50D;G50E;G50F;G50H;
G50I;G50K;G50L;G50M;G50N;G50P;G50Q;G50R;G50S;G50T;G50V;G50W;G5
0Y;E51A;E51C;E51D;E51F;E51G;E51H;E51I;E51K;E51L;E51M;E51N;E51P;E51
Q;E51R;E51S;E51T;E51V;E51W;E51Y;P52A;P52C;P52D;P52E;P52F;P52G;P52
H;P52I;P52K;P52L;P52M;P52N;P52Q;P52R;P52S;P52T;P52V;P52W;P52Y;S53
A;S53C;S53D;S53E;S53F;S53G;S53H;S53I;S53K;S53L;S53M;S53N;S53P;S53
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4I;R54K;R54L;R54M;R54N;R54P;R54Q;R54S;R54T;R54V;R54W;R54Y;E55A;E
55C;E55D;E55F;E55G;E55H;E55I;E55K;E55L;E55M;E55N;E55P;E55Q;E55R;E
55S;E55T;E55V;E55W;E55Y;T56A;T56C;T56D;T56E;T56F;T56G;T56H;T56I;T5
6K;T56L;T56M;T56N;T56P;T56Q;T56R;T56S;T56V;T56W;T56Y;P57A;P57C;P5
7D;P57E;P57F;P57G;P57H;P57I;P57K;P57L;P57M;P57N;P57Q;P57R;P57S;P5
7T;P57V;P57W;P57Y;N58A;N58C;N58D;N58E;N58F;N58G;N58H;N58I;N58K;N
58L;N58M;N58P;N58Q;N58R;N58S;N58T;N58V;N58W;N58Y;L59A;L59C;L59D;
L59E;L59F;L59G;L59H;L59I;L59K;L59M;L59N;L59P;L59Q;L59R;L59S;L59T;L59
V;L59W;L59Y;D60A;D60C;D60E;D60F;D60G;D60H;D60I;D60K;D60L;D60M;D60
N;D60P;D60Q;D60R;D60S;D60T;D60V;D60W;D60Y;R61A;R61C;R61D;R61E;R
61F;R61G;R61H;R61I;R61K;R61L;R61M;R61N;R61P;R61Q;R61S;R61T;R61V;
R61W;R61Y;M62A;M62C;M62D;M62E;M62F;M62G;M62H;M62I;M62K;M62L;M6
2N;M62P;M62Q;M62R;M62S;M62T;M62V;M62W;M62Y;A63C;A63D;A63E;A63F

;A63G;A63H;A63I;A63K;A63L;A63M;A63N;A63P;A63Q;A63R;A63S;A63T;A63V;
A63W;A63Y;A64C;A64D;A64E;A64F;A64G;A64H;A64I;A64K;A64L;A64M;A64N;
A64P;A64Q;A64R;A64S;A64T;A64V;A64W;A64Y;E65A;E65C;E65D;E65F;E65G;
E65H;E65I;E65K;E65L;E65M;E65N;E65P;E65Q;E65R;E65S;E65T;E65V;E65W;
E65Y;G66A;G66C;G66D;G66E;G66F;G66H;G66I;G66K;G66L;G66M;G66N;G66
P;G66Q;G66R;G66S;G66T;G66V;G66W;G66Y;L67A;L67C;L67D;L67E;L67F;L67
G;L67H;L67I;L67K;L67M;L67N;L67P;L67Q;L67R;L67S;L67T;L67V;L67W;L67Y;L
68A;L68C;L68D;L68E;L68F;L68G;L68H;L68I;L68K;L68M;L68N;L68P;L68Q;L68R
;L68S;L68T;L68V;L68W;L68Y;F69A;F69C;F69D;F69E;F69G;F69H;F69I;F69K;F6
9L;F69M;F69N;F69P;F69Q;F69R;F69S;F69T;F69V;F69W;F69Y;P70A;P70C;P70
D;P70E;P70F;P70G;P70H;P70I;P70K;P70L;P70M;P70N;P70Q;P70R;P70S;P70
T;P70V;P70W;P70Y;N71A;N71C;N71D;N71E;N71F;N71G;N71H;N71I;N71K;N7
1L;N71M;N71P;N71Q;N71R;N71S;N71T;N71V;N71W;N71Y;F72A;F72C;F72D;F
72E;F72G;F72H;F72I;F72K;F72L;F72M;F72N;F72P;F72Q;F72R;F72S;F72T;F72
V;F72W;F72Y;Y73A;Y73C;Y73D;Y73E;Y73F;Y73G;Y73H;Y73I;Y73K;Y73L;Y73
M;Y73N;Y73P;Y73Q;Y73R;Y73S;Y73T;Y73V;Y73W;S74A;S74C;S74D;S74E;S7
4F;S74G;S74H;S74I;S74K;S74L;S74M;S74N;S74P;S74Q;S74R;S74T;S74V;S74
W;S74Y;A75C;A75D;A75E;A75F;A75G;A75H;A75I;A75K;A75L;A75M;A75N;A75
P;A75Q;A75R;A75S;A75T;A75V;A75W;A75Y;N76A;N76C;N76D;N76E;N76F;N7
6G;N76H;N76I;N76K;N76L;N76M;N76P;N76Q;N76R;N76S;N76T;N76V;N76W;N
76Y;P77A;P77C;P77D;P77E;P77F;P77G;P77H;P77I;P77K;P77L;P77M;P77N;P7
7Q;P77R;P77S;P77T;P77V;P77W;P77Y;L78A;L78C;L78D;L78E;L78F;L78G;L78
H;L78I;L78K;L78M;L78N;L78P;L78Q;L78R;L78S;L78T;L78V;L78W;L78Y;C79A;
C79D;C79E;C79F;C79G;C79H;C79I;C79K;C79L;C79M;C79N;C79P;C79Q;C79R
;C79S;C79T;C79V;C79W;C79Y;S80A;S80C;S80D;S80E;S80F;S80G;S80H;S80I
;S80K;S80L;S80M;S80N;S80P;S80Q;S80R;S80T;S80V;S80W;S80Y;P81A;P81C
;P81D;P81E;P81F;P81G;P81H;P81I;P81K;P81L;P81M;P81N;P81Q;P81R;P81S;
P81T;P81V;P81W;P81Y;S82A;S82C;S82D;S82E;S82F;S82G;S82H;S82I;S82K;
S82L;S82M;S82N;S82P;S82Q;S82R;S82T;S82V;S82W;S82Y;R83A;R83C;R83D
;R83E;R83F;R83G;R83H;R83I;R83K;R83L;R83M;R83N;R83P;R83Q;R83S;R83
T;R83V;R83W;R83Y;A84C;A84D;A84E;A84F;A84G;A84H;A84I;A84K;A84L;A84
M;A84N;A84P;A84Q;A84R;A84S;A84T;A84V;A84W;A84Y;A85C;A85D;A85E;A8
5F;A85G;A85H;A85I;A85K;A85L;A85M;A85N;A85P;A85Q;A85R;A85S;A85T;A85
V;A85W;A85Y;L86A;L86C;L86D;L86E;L86F;L86G;L86H;L86I;L86K;L86M;L86N;
L86P;L86Q;L86R;L86S;L86T;L86V;L86W;L86Y;L87A;L87C;L87D;L87E;L87F;L8
7G;L87H;L87I;L87K;L87M;L87N;L87P;L87Q;L87R;L87S;L87T;L87V;L87W;L87Y;
T88A;T88C;T88D;T88E;T88F;T88G;T88H;T88I;T88K;T88L;T88M;T88N;T88P;T8
8Q;T88R;T88S;T88V;T88W;T88Y;G89A;G89C;G89D;G89E;G89F;G89H;G89I;G
89K;G89L;G89M;G89N;G89P;G89Q;G89R;G89S;G89T;G89V;G89W;G89Y;R90
A;R90C;R90D;R90E;R90F;R90G;R90H;R90I;R90K;R90L;R90M;R90N;R90P;R9
0Q;R90S;R90T;R90V;R90W;R90Y;L91A;L91C;L91D;L91E;L91F;L91G;L91H;L91
I;L91K;L91M;L91N;L91P;L91Q;L91R;L91S;L91T;L91V;L91W;L91Y;P92A;P92C;
P92D;P92E;P92F;P92G;P92H;P92I;P92K;P92L;P92M;P92N;P92Q;P92R;P92S;
P92T;P92V;P92W;P92Y;I93A;I93C;I93D;I93E;I93F;I93G;I93H;I93K;I93L;I93M;I9
3N;I93P;I93Q;I93R;I93S;I93T;I93V;I93W;I93Y;R94A;R94C;R94D;R94E;R94F;R9
4G;R94H;R94I;R94K;R94L;R94M;R94N;R94P;R94Q;R94S;R94T;R94V;R94W;R

94Y;N95A;N95C;N95D;N95E;N95F;N95G;N95H;N95I;N95K;N95L;N95M;N95P;
N95Q;N95R;N95S;N95T;N95V;N95W;N95Y;G96A;G96C;G96D;G96E;G96F;G96
H;G96I;G96K;G96L;G96M;G96N;G96P;G96Q;G96R;G96S;G96T;G96V;G96W;G
96Y;F97A;F97C;F97D;F97E;F97G;F97H;F97I;F97K;F97L;F97M;F97N;F97P;F97
Q;F97R;F97S;F97T;F97V;F97W;F97Y;Y98A;Y98C;Y98D;Y98E;Y98F;Y98G;Y98
H;Y98I;Y98K;Y98L;Y98M;Y98N;Y98P;Y98Q;Y98R;Y98S;Y98T;Y98V;Y98W;T99
A;T99C;T99D;T99E;T99F;T99G;T99H;T99I;T99K;T99L;T99M;T99N;T99P;T99Q;
T99R;T99S;T99V;T99W;T99Y;T100A;T100C;T100D;T100E;T100F;T100G;T100
H;T100I;T100K;T100L;T100M;T100N;T100P;T100Q;T100R;T100S;T100V;T100
W;T100Y;N101A;N101C;N101D;N101E;N101F;N101G;N101H;N101I;N101K;N1
01L;N101M;N101P;N101Q;N101R;N101S;N101T;N101V;N101W;N101Y;A102C;
A102D;A102E;A102F;A102G;A102H;A102I;A102K;A102L;A102M;A102N;A102P;
A102Q;A102R;A102S;A102T;A102V;A102W;A102Y;H103A;H103C;H103D;H103
E;H103F;H103G;H103I;H103K;H103L;H103M;H103N;H103P;H103Q;H103R;H1
03S;H103T;H103V;H103W;H103Y;A104C;A104D;A104E;A104F;A104G;A104H;
A104I;A104K;A104L;A104M;A104N;A104P;A104Q;A104R;A104S;A104T;A104V;
A104W;A104Y;R105A;R105C;R105D;R105E;R105F;R105G;R105H;R105I;R105
K;R105L;R105M;R105N;R105P;R105Q;R105S;R105T;R105V;R105W;R105Y;N
106A;N106C;N106D;N106E;N106F;N106G;N106H;N106I;N106K;N106L;N106M;
N106P;N106Q;N106R;N106S;N106T;N106V;N106W;N106Y;A107C;A107D;A10
7E;A107F;A107G;A107H;A107I;A107K;A107L;A107M;A107N;A107P;A107Q;A1
07R;A107S;A107T;A107V;A107W;A107Y;Y108A;Y108C;Y108D;Y108E;Y108F;Y
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Y108T;Y108V;Y108W;T109A;T109C;T109D;T109E;T109F;T109G;T109H;T109I;
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;P110A;P110C;P110D;P110E;P110F;P110G;P110H;P110I;P110K;P110L;P110M
;P110N;P110Q;P110R;P110S;P110T;P110V;P110W;P110Y;Q111A;Q111C;Q11
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Q111R;Q111S;Q111T;Q111V;Q111W;Q111Y;E112A;E112C;E112D;E112F;E11
2G;E112H;E112I;E112K;E112L;E112M;E112N;E112P;E112Q;E112R;E112S;E1
12T;E112V;E112W;E112Y;I113A;I113C;I113D;I113E;I113F;I113G;I113H;I113K;I
113L;I113M;I113N;I113P;I113Q;I113R;I113S;I113T;I113V;I113W;I113Y;V114A;V
114C;V114D;V114E;V114F;V114G;V114H;V114I;V114K;V114L;V114M;V114N;
V114P;V114Q;V114R;V114S;V114T;V114W;V114Y;G115A;G115C;G115D;G11
5E;G115F;G115H;G115I;G115K;G115L;G115M;G115N;G115P;G115Q;G115R;
G115S;G115T;G115V;G115W;G115Y;G116A;G116C;G116D;G116E;G116F;G1
16H;G116I;G116K;G116L;G116M;G116N;G116P;G116Q;G116R;G116S;G116T;
G116V;G116W;G116Y;I117A;I117C;I117D;I117E;I117F;I117G;I117H;I117K;I117
L;I117M;I117N;I117P;I117Q;I117R;I117S;I117T;I117V;I117W;I117Y;P118A;P118
C;P118D;P118E;P118F;P118G;P118H;P118I;P118K;P118L;P118M;P118N;P11
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;D119T;D119V;D119W;D119Y;S120A;S120C;S120D;S120E;S120F;S120G;S12
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0W;S120Y;E121A;E121C;E121D;E121F;E121G;E121H;E121I;E121K;E121L;E1
21M;E121N;E121P;E121Q;E121R;E121S;E121T;E121V;E121W;E121Y;Q122A;

Q122C;Q122D;Q122E;Q122F;Q122G;Q122H;Q122I;Q122K;Q122L;Q122M;Q122N;Q122P;Q122R;Q122S;Q122T;Q122V;Q122W;Q122Y;L123A;L123C;L123D;L123E;L123F;L123G;L123H;L123I;L123K;L123M;L123N;L123P;L123Q;L123R;L123S;L123T;L123V;L123W;L123Y;L124A;L124C;L124D;L124E;L124F;L124G;L124H;L124I;L124K;L124M;L124N;L124P;L124Q;L124R;L124S;L124T;L124V;L124W;L124Y;P125A;P125C;P125D;P125E;P125F;P125G;P125H;P125I;P125K;P125L;P125M;P125N;P125Q;P125R;P125S;P125T;P125V;P125W;P125Y;E126A;E126C;E126D;E126F;E126G;E126H;E126I;E126K;E126L;E126M;E126N;E126P;E126Q;E126R;E126S;E126T;E126V;E126W;E126Y;L127A;L127C;L127D;L127E;L127F;L127G;L127H;L127I;L127K;L127M;L127N;L127P;L127Q;L127R;L127S;L127T;L127V;L127W;L127Y;L128A;L128C;L128D;L128E;L128F;L128G;L128H;L128I;L128K;L128M;L128N;L128P;L128Q;L128R;L128S;L128T;L128V;L128W;L128Y;K129A;K129C;K129D;K129E;K129F;K129G;K129H;K129I;K129L;K129M;K129N;K129P;K129Q;K129R;K129S;K129T;K129V;K129W;K129Y;K130A;K130C;K130D;K130E;K130F;K130G;K130H;K130I;K130L;K130M;K130N;K130P;K130Q;K130R;K130S;K130T;K130V;K130W;K130Y;A131C;A131D;A131E;A131F;A131G;A131H;A131I;A131K;A131L;A131M;A131N;A131P;A131Q;A131R;A131S;A131T;A131V;A131W;A131Y;G132A;G132C;G132D;G132E;G132F;G132H;G132I;G132K;G132L;G132M;G132N;G132P;G132Q;G132R;G132S;G132T;G132V;G132W;G132Y;Y133A;Y133C;Y133D;Y133E;Y133F;Y133G;Y133H;Y133I;Y133K;Y133L;Y133M;Y133N;Y133P;Y133Q;Y133R;Y133S;Y133T;Y133V;Y133W;V134A;V134C;V134D;V134E;V134F;V134G;V134H;V134I;V134K;V134L;V134M;V134N;V134P;V134Q;V134R;V134S;V134T;V134W;V134Y;S135A;S135C;S135D;S135E;S135F;S135G;S135H;S135I;S135K;S135L;S135M;S135N;S135P;S135Q;S135R;S135T;S135V;S135W;S135Y;K136A;K136C;K136D;K136E;K136F;K136G;K136H;K136I;K136L;K136M;K136N;K136P;K136Q;K136R;K136S;K136T;K136V;K136W;K136Y;I137A;I137C;I137D;I137E;I137F;I137G;I137H;I137K;I137L;I137M;I137N;I137P;I137Q;I137R;I137S;I137T;I137V;I137W;I137Y;V138A;V138C;V138D;V138E;V138F;V138G;V138H;V138I;V138K;V138L;V138M;V138N;V138P;V138Q;V138R;V138S;V138T;V138W;V138Y;G139A;G139C;G139D;G139E;G139F;G139H;G139I;G139K;G139L;G139M;G139N;G139P;G139Q;G139R;G139S;G139T;G139V;G139W;G139Y;K140A;K140C;K140D;K140E;K140F;K140G;K140H;K140I;K140L;K140M;K140N;K140P;K140Q;K140R;K140S;K140T;K140V;K140W;K140Y;W141A;W141C;W141D;W141E;W141F;W141G;W141H;W141I;W141K;W141L;W141M;W141N;W141P;W141Q;W141R;W141S;W141T;W141V;W141Y;H142A;H142C;H142D;H142E;H142F;H142G;H142I;H142K;H142L;H142M;H142N;H142P;H142Q;H142R;H142S;H142T;H142V;H142W;H142Y;L143A;L143C;L143D;L143E;L143F;L143G;L143H;L143I;L143K;L143M;L143N;L143P;L143Q;L143R;L143S;L143T;L143V;L143W;L143Y;G144A;G144C;G144D;G144E;G144F;G144H;G144I;G144K;G144L;G144M;G144N;G144P;G144Q;G144R;G144S;G144T;G144V;G144W;G144Y;H145A;H145C;H145D;H145E;H145F;H145G;H145I;H145K;H145L;H145M;H145N;H145P;H145Q;H145R;H145S;H145T;H145V;H145W;H145Y;R146A;R146C;R146D;R146E;R146F;R146G;R146H;R146I;R146K;R146L;R146M;R146N;R146P;R146Q;R146S;R146T;R146V;R146W;R146Y;P147A;P147C;P147D;P147E;P147F;P147G;P147H;P147I;P147K;P147L;P147M;P147N;P147Q;P147R;P147S;P147T;P147V;P147W;P147Y;Q148A;Q148C;Q148D;Q148E;Q14

8F;Q148G;Q148H;Q148I;Q148K;Q148L;Q148M;Q148N;Q148P;Q148R;Q148S;
Q148T;Q148V;Q148W;Q148Y;F149A;F149C;F149D;F149E;F149G;F149H;F149I
;F149K;F149L;F149M;F149N;F149P;F149Q;F149R;F149S;F149T;F149V;F149W
;F149Y;H150A;H150C;H150D;H150E;H150F;H150G;H150I;H150K;H150L;H150
M;H150N;H150P;H150Q;H150R;H150S;H150T;H150V;H150W;H150Y;P151A;P
151C;P151D;P151E;P151F;P151G;P151H;P151I;P151K;P151L;P151M;P151N;
P151Q;P151R;P151S;P151T;P151V;P151W;P151Y;L152A;L152C;L152D;L152E
;L152F;L152G;L152H;L152I;L152K;L152M;L152N;L152P;L152Q;L152R;L152S;L
152T;L152V;L152W;L152Y;K153A;K153C;K153D;K153E;K153F;K153G;K153H;
K153I;K153L;K153M;K153N;K153P;K153Q;K153R;K153S;K153T;K153V;K153W
;K153Y;H154A;H154C;H154D;H154E;H154F;H154G;H154I;H154K;H154L;H154
M;H154N;H154P;H154Q;H154R;H154S;H154T;H154V;H154W;H154Y;G155A;G
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P;G155Q;G155R;G155S;G155T;G155V;G155W;G155Y;F156A;F156C;F156D;F
156E;F156G;F156H;F156I;F156K;F156L;F156M;F156N;F156P;F156Q;F156R;F
156S;F156T;F156V;F156W;F156Y;D157A;D157C;D157E;D157F;D157G;D157H;
D157I;D157K;D157L;D157M;D157N;D157P;D157Q;D157R;D157S;D157T;D157
V;D157W;D157Y;E158A;E158C;E158D;E158F;E158G;E158H;E158I;E158K;E15
8L;E158M;E158N;E158P;E158Q;E158R;E158S;E158T;E158V;E158W;E158Y;W
159A;W159C;W159D;W159E;W159F;W159G;W159H;W159I;W159K;W159L;W1
59M;W159N;W159P;W159Q;W159R;W159S;W159T;W159V;W159Y;F160A;F16
0C;F160D;F160E;F160G;F160H;F160I;F160K;F160L;F160M;F160N;F160P;F16
0Q;F160R;F160S;F160T;F160V;F160W;F160Y;G161A;G161C;G161D;G161E;G
161F;G161H;G161I;G161K;G161L;G161M;G161N;G161P;G161Q;G161R;G161
S;G161T;G161V;G161W;G161Y;S162A;S162C;S162D;S162E;S162F;S162G;S1
62H;S162I;S162K;S162L;S162M;S162N;S162P;S162Q;S162R;S162T;S162V;S1
62W;S162Y;P163A;P163C;P163D;P163E;P163F;P163G;P163H;P163I;P163K;P
163L;P163M;P163N;P163Q;P163R;P163S;P163T;P163V;P163W;P163Y;N164A;
N164C;N164D;N164E;N164F;N164G;N164H;N164I;N164K;N164L;N164M;N164
P;N164Q;N164R;N164S;N164T;N164V;N164W;N164Y;C165A;C165D;C165E;C
165F;C165G;C165H;C165I;C165K;C165L;C165M;C165N;C165P;C165Q;C165R;
C165S;C165T;C165V;C165W;C165Y;H166A;H166C;H166D;H166E;H166F;H16
6G;H166I;H166K;H166L;H166M;H166N;H166P;H166Q;H166R;H166S;H166T;H
166V;H166W;H166Y;F167A;F167C;F167D;F167E;F167G;F167H;F167I;F167K;F
167L;F167M;F167N;F167P;F167Q;F167R;F167S;F167T;F167V;F167W;F167Y;
G168A;G168C;G168D;G168E;G168F;G168H;G168I;G168K;G168L;G168M;G16
8N;G168P;G168Q;G168R;G168S;G168T;G168V;G168W;G168Y;P169A;P169C;
P169D;P169E;P169F;P169G;P169H;P169I;P169K;P169L;P169M;P169N;P169Q
;P169R;P169S;P169T;P169V;P169W;P169Y;Y170A;Y170C;Y170D;Y170E;Y170
F;Y170G;Y170H;Y170I;Y170K;Y170L;Y170M;Y170N;Y170P;Y170Q;Y170R;Y17
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D171Y;N172A;N172C;N172D;N172E;N172F;N172G;N172H;N172I;N172K;N172
L;N172M;N172P;N172Q;N172R;N172S;N172T;N172V;N172W;N172Y;K173A;K1
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173Q;K173R;K173S;K173T;K173V;K173W;K173Y;A174C;A174D;A174E;A174F;

A174G;A174H;A174I;A174K;A174L;A174M;A174N;A174P;A174Q;A174R;A174S
;A174T;A174V;A174W;A174Y;R175A;R175C;R175D;R175E;R175F;R175G;R17
5H;R175I;R175K;R175L;R175M;R175N;R175P;R175Q;R175S;R175T;R175V;R1
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N177C;N177D;N177E;N177F;N177G;N177H;N177I;N177K;N177L;N177M;N177
P;N177Q;N177R;N177S;N177T;N177V;N177W;N177Y;I178A;I178C;I178D;I178
E;I178F;I178G;I178H;I178K;I178L;I178M;I178N;I178P;I178Q;I178R;I178S;I178T;
I178V;I178W;I178Y;P179A;P179C;P179D;P179E;P179F;P179G;P179H;P179I;P
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Q;Y181R;Y181S;Y181T;Y181V;Y181W;R182A;R182C;R182D;R182E;R182F;R1
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R182V;R182W;R182Y;D183A;D183C;D183E;D183F;D183G;D183H;D183I;D183
K;D183L;D183M;D183N;D183P;D183Q;D183R;D183S;D183T;D183V;D183W;D
183Y;W184A;W184C;W184D;W184E;W184F;W184G;W184H;W184I;W184K;W1
84L;W184M;W184N;W184P;W184Q;W184R;W184S;W184T;W184V;W184Y;E1
85A;E185C;E185D;E185F;E185G;E185H;E185I;E185K;E185L;E185M;E185N;E
185P;E185Q;E185R;E185S;E185T;E185V;E185W;E185Y;M186A;M186C;M186
D;M186E;M186F;M186G;M186H;M186I;M186K;M186L;M186N;M186P;M186Q;
M186R;M186S;M186T;M186V;M186W;M186Y;V187A;V187C;V187D;V187E;V18
7F;V187G;V187H;V187I;V187K;V187L;V187M;V187N;V187P;V187Q;V187R;V1
87S;V187T;V187W;V187Y;G188A;G188C;G188D;G188E;G188F;G188H;G188I;
G188K;G188L;G188M;G188N;G188P;G188Q;G188R;G188S;G188T;G188V;G1
88W;G188Y;R189A;R189C;R189D;R189E;R189F;R189G;R189H;R189I;R189K;
R189L;R189M;R189N;R189P;R189Q;R189S;R189T;R189V;R189W;R189Y;Y19
0A;Y190C;Y190D;Y190E;Y190F;Y190G;Y190H;Y190I;Y190K;Y190L;Y190M;Y19
0N;Y190P;Y190Q;Y190R;Y190S;Y190T;Y190V;Y190W;Y191A;Y191C;Y191D;Y
191E;Y191F;Y191G;Y191H;Y191I;Y191K;Y191L;Y191M;Y191N;Y191P;Y191Q;
Y191R;Y191S;Y191T;Y191V;Y191W;E192A;E192C;E192D;E192F;E192G;E192
H;E192I;E192K;E192L;E192M;E192N;E192P;E192Q;E192R;E192S;E192T;E192
V;E192W;E192Y;E193A;E193C;E193D;E193F;E193G;E193H;E193I;E193K;E19
3L;E193M;E193N;E193P;E193Q;E193R;E193S;E193T;E193V;E193W;E193Y;F1
94A;F194C;F194D;F194E;F194G;F194H;F194I;F194K;F194L;F194M;F194N;F1
94P;F194Q;F194R;F194S;F194T;F194V;F194W;F194Y;P195A;P195C;P195D;P
195E;P195F;P195G;P195H;P195I;P195K;P195L;P195M;P195N;P195Q;P195R;
P195S;P195T;P195V;P195W;P195Y;I196A;I196C;I196D;I196E;I196F;I196G;I19
6H;I196K;I196L;I196M;I196N;I196P;I196Q;I196R;I196S;I196T;I196V;I196W;I196
Y;N197A;N197C;N197D;N197E;N197F;N197G;N197H;N197I;N197K;N197L;N19
7M;N197P;N197Q;N197R;N197S;N197T;N197V;N197W;N197Y;L198A;L198C;L
198D;L198E;L198F;L198G;L198H;L198I;L198K;L198M;L198N;L198P;L198Q;L1
98R;L198S;L198T;L198V;L198W;L198Y;K199A;K199C;K199D;K199E;K199F;K1
99G;K199H;K199I;K199L;K199M;K199N;K199P;K199Q;K199R;K199S;K199T;K
199V;K199W;K199Y;T200A;T200C;T200D;T200E;T200F;T200G;T200H;T200I;T

200K;T200L;T200M;T200N;T200P;T200Q;T200R;T200S;T200V;T200W;T200Y;
G201A;G201C;G201D;G201E;G201F;G201H;G201I;G201K;G201L;G201M;G20
1N;G201P;G201Q;G201R;G201S;G201T;G201V;G201W;G201Y;E202A;E202C;
E202D;E202F;E202G;E202H;E202I;E202K;E202L;E202M;E202N;E202P;E202Q
;E202R;E202S;E202T;E202V;E202W;E202Y;A203C;A203D;A203E;A203F;A203
G;A203H;A203I;A203K;A203L;A203M;A203N;A203P;A203Q;A203R;A203S;A20
3T;A203V;A203W;A203Y;N204A;N204C;N204D;N204E;N204F;N204G;N204H;N
204I;N204K;N204L;N204M;N204P;N204Q;N204R;N204S;N204T;N204V;N204W
;N204Y;L205A;L205C;L205D;L205E;L205F;L205G;L205H;L205I;L205K;L205M;L
205N;L205P;L205Q;L205R;L205S;L205T;L205V;L205W;L205Y;T206A;T206C;T
206D;T206E;T206F;T206G;T206H;T206I;T206K;T206L;T206M;T206N;T206P;T2
06Q;T206R;T206S;T206V;T206W;T206Y;Q207A;Q207C;Q207D;Q207E;Q207F;
Q207G;Q207H;Q207I;Q207K;Q207L;Q207M;Q207N;Q207P;Q207R;Q207S;Q20
7T;Q207V;Q207W;Q207Y;I208A;I208C;I208D;I208E;I208F;I208G;I208H;I208K;I
208L;I208M;I208N;I208P;I208Q;I208R;I208S;I208T;I208V;I208W;I208Y;Y209A;Y
209C;Y209D;Y209E;Y209F;Y209G;Y209H;Y209I;Y209K;Y209L;Y209M;Y209N;
Y209P;Y209Q;Y209R;Y209S;Y209T;Y209V;Y209W;L210A;L210C;L210D;L210E
;L210F;L210G;L210H;L210I;L210K;L210M;L210N;L210P;L210Q;L210R;L210S;L
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H;Q211I;Q211K;Q211L;Q211M;Q211N;Q211P;Q211R;Q211S;Q211T;Q211V;Q2
11W;Q211Y;E212A;E212C;E212D;E212F;E212G;E212H;E212I;E212K;E212L;E
212M;E212N;E212P;E212Q;E212R;E212S;E212T;E212V;E212W;E212Y;A213C
;A213D;A213E;A213F;A213G;A213H;A213I;A213K;A213L;A213M;A213N;A213P
;A213Q;A213R;A213S;A213T;A213V;A213W;A213Y;L214A;L214C;L214D;L214
E;L214F;L214G;L214H;L214I;L214K;L214M;L214N;L214P;L214Q;L214R;L214S;
L214T;L214V;L214W;L214Y;D215A;D215C;D215E;D215F;D215G;D215H;D215I
;D215K;D215L;D215M;D215N;D215P;D215Q;D215R;D215S;D215T;D215V;D21
5W;D215Y;F216A;F216C;F216D;F216E;F216G;F216H;F216I;F216K;F216L;F21
6M;F216N;F216P;F216Q;F216R;F216S;F216T;F216V;F216W;F216Y;I217A;I217
C;I217D;I217E;I217F;I217G;I217H;I217K;I217L;I217M;I217N;I217P;I217Q;I217R
;I217S;I217T;I217V;I217W;I217Y;K218A;K218C;K218D;K218E;K218F;K218G;K
218H;K218I;K218L;K218M;K218N;K218P;K218Q;K218R;K218S;K218T;K218V;K
218W;K218Y;R219A;R219C;R219D;R219E;R219F;R219G;R219H;R219I;R219K
;R219L;R219M;R219N;R219P;R219Q;R219S;R219T;R219V;R219W;R219Y;Q22
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Q220N;Q220P;Q220R;Q220S;Q220T;Q220V;Q220W;Q220Y;A221C;A221D;A22
1E;A221F;A221G;A221H;A221I;A221K;A221L;A221M;A221N;A221P;A221Q;A2
21R;A221S;A221T;A221V;A221W;A221Y;R222A;R222C;R222D;R222E;R222F;
R222G;R222H;R222I;R222K;R222L;R222M;R222N;R222P;R222Q;R222S;R222
T;R222V;R222W;R222Y;H223A;H223C;H223D;H223E;H223F;H223G;H223I;H2
23K;H223L;H223M;H223N;H223P;H223Q;H223R;H223S;H223T;H223V;H223W;
H223Y;H224A;H224C;H224D;H224E;H224F;H224G;H224I;H224K;H224L;H224
M;H224N;H224P;H224Q;H224R;H224S;H224T;H224V;H224W;H224Y;P225A;P
225C;P225D;P225E;P225F;P225G;P225H;P225I;P225K;P225L;P225M;P225N;
P225Q;P225R;P225S;P225T;P225V;P225W;P225Y;F226A;F226C;F226D;F226
E;F226G;F226H;F226I;F226K;F226L;F226M;F226N;F226P;F226Q;F226R;F226

S;F226T;F226V;F226W;F226Y;F227A;F227C;F227D;F227E;F227G;F227H;F227I;F227K;F227L;F227M;F227N;F227P;F227Q;F227R;F227S;F227T;F227V;F227W;F227Y;L228A;L228C;L228D;L228E;L228F;L228G;L228H;L228I;L228K;L228M;L228N;L228P;L228Q;L228R;L228S;L228T;L228V;L228W;L228Y;Y229A;Y229C;Y229D;Y229E;Y229F;Y229G;Y229H;Y229I;Y229K;Y229L;Y229M;Y229N;Y229P;Y229Q;Y229R;Y229S;Y229T;Y229V;Y229W;W230A;W230C;W230D;W230E;W230F;W230G;W230H;W230I;W230K;W230L;W230M;W230N;W230P;W230Q;W230R;W230S;W230T;W230V;W230Y;A231C;A231D;A231E;A231F;A231G;A231H;A231I;A231K;A231L;A231M;A231N;A231P;A231Q;A231R;A231S;A231T;A231V;A231W;A231Y;V232A;V232C;V232D;V232E;V232F;V232G;V232H;V232I;V232K;V232L;V232M;V232N;V232P;V232Q;V232R;V232S;V232T;V232W;V232Y;D233A;D233C;D233E;D233F;D233G;D233H;D233I;D233K;D233L;D233M;D233N;D233P;D233Q;D233R;D233S;D233T;D233V;D233W;D233Y;A234C;A234D;A234E;A234F;A234G;A234H;A234I;A234K;A234L;A234M;A234N;A234P;A234Q;A234R;A234S;A234T;A234V;A234W;A234Y;T235A;T235C;T235D;T235E;T235F;T235G;T235H;T235I;T235K;T235L;T235M;T235N;T235P;T235Q;T235R;T235S;T235V;T235W;T235Y;H236A;H236C;H236D;H236E;H236F;H236G;H236I;H236K;H236L;H236M;H236N;H236P;H236Q;H236R;H236S;H236T;H236V;H236W;H236Y;A237C;A237D;A237E;A237F;A237G;A237H;A237I;A237K;A237L;A237M;A237N;A237P;A237Q;A237R;A237S;A237T;A237V;A237W;A237Y;P238A;P238C;P238D;P238E;P238F;P238G;P238H;P238I;P238K;P238L;P238M;P238N;P238Q;P238R;P238S;P238T;P238V;P238W;P238Y;V239A;V239C;V239D;V239E;V239F;V239G;V239H;V239I;V239K;V239L;V239M;V239N;V239P;V239Q;V239R;V239S;V239T;V239W;V239Y;Y240A;Y240C;Y240D;Y240E;Y240F;Y240G;Y240H;Y240I;Y240K;Y240L;Y240M;Y240N;Y240P;Y240Q;Y240R;Y240S;Y240T;Y240V;Y240W;A241C;A241D;A241E;A241F;A241G;A241H;A241I;A241K;A241L;A241M;A241N;A241P;A241Q;A241R;A241S;A241T;A241V;A241W;A241Y;S242A;S242C;S242D;S242E;S242F;S242G;S242H;S242I;S242K;S242L;S242M;S242N;S242P;S242Q;S242R;S242T;S242V;S242W;S242Y;K243A;K243C;K243D;K243E;K243F;K243G;K243H;K243I;K243L;K243M;K243N;K243P;K243Q;K243R;K243S;K243T;K243V;K243W;K243Y;P244A;P244C;P244D;P244E;P244F;P244G;P244H;P244I;P244K;P244L;P244M;P244N;P244Q;P244R;P244S;P244T;P244V;P244W;P244Y;F245A;F245C;F245D;F245E;F245G;F245H;F245I;F245K;F245L;F245M;F245N;F245P;F245Q;F245R;F245S;F245T;F245V;F245W;F245Y;L246A;L246C;L246D;L246E;L246F;L246G;L246H;L246I;L246K;L246M;L246N;L246P;L246Q;L246R;L246S;L246T;L246V;L246W;L246Y;G247A;G247C;G247D;G247E;G247F;G247H;G247I;G247K;G247L;G247M;G247N;G247P;G247Q;G247R;G247S;G247T;G247V;G247W;G247Y;T248A;T248C;T248D;T248E;T248F;T248G;T248H;T248I;T248K;T248L;T248M;T248N;T248P;T248Q;T248R;T248S;T248V;T248W;T248Y;S249A;S249C;S249D;S249E;S249F;S249G;S249H;S249I;S249K;S249L;S249M;S249N;S249P;S249Q;S249R;S249T;S249V;S249W;S249Y;Q250A;Q250C;Q250D;Q250E;Q250F;Q250G;Q250H;Q250I;Q250K;Q250L;Q250M;Q250N;Q250P;Q250R;Q250S;Q250T;Q250V;Q250W;Q250Y;R251A;R251C;R251D;R251E;R251F;R251G;R251H;R251I;R251K;R251L;R251M;R251N;R251P;R251Q;R251S;R251T;R251V;R251W;R251Y;G252A;G252C;G252D;G252E;G252F;G252H;G252I;G252K;G252L;G252M;G252N;G252P;G252Q;G252R;G252S;G252T;G252V;G

252W;G252Y;R253A;R253C;R253D;R253E;R253F;R253G;R253H;R253I;R253K
;R253L;R253M;R253N;R253P;R253Q;R253S;R253T;R253V;R253W;R253Y;Y25
4A;Y254C;Y254D;Y254E;Y254F;Y254G;Y254H;Y254I;Y254K;Y254L;Y254M;Y25
4N;Y254P;Y254Q;Y254R;Y254S;Y254T;Y254V;Y254W;G255A;G255C;G255D;G
255E;G255F;G255H;G255I;G255K;G255L;G255M;G255N;G255P;G255Q;G255
R;G255S;G255T;G255V;G255W;G255Y;D256A;D256C;D256E;D256F;D256G;D
256H;D256I;D256K;D256L;D256M;D256N;D256P;D256Q;D256R;D256S;D256T;
D256V;D256W;D256Y;A257C;A257D;A257E;A257F;A257G;A257H;A257I;A257
K;A257L;A257M;A257N;A257P;A257Q;A257R;A257S;A257T;A257V;A257W;A2
57Y;V258A;V258C;V258D;V258E;V258F;V258G;V258H;V258I;V258K;V258L;V2
58M;V258N;V258P;V258Q;V258R;V258S;V258T;V258W;V258Y;R259A;R259C;
R259D;R259E;R259F;R259G;R259H;R259I;R259K;R259L;R259M;R259N;R259
P;R259Q;R259S;R259T;R259V;R259W;R259Y;E260A;E260C;E260D;E260F;E2
60G;E260H;E260I;E260K;E260L;E260M;E260N;E260P;E260Q;E260R;E260S;E
260T;E260V;E260W;E260Y;I261A;I261C;I261D;I261E;I261F;I261G;I261H;I261K
;I261L;I261M;I261N;I261P;I261Q;I261R;I261S;I261T;I261V;I261W;I261Y;D262A;
D262C;D262E;D262F;D262G;D262H;D262I;D262K;D262L;D262M;D262N;D262
P;D262Q;D262R;D262S;D262T;D262V;D262W;D262Y;D263A;D263C;D263E;D
263F;D263G;D263H;D263I;D263K;D263L;D263M;D263N;D263P;D263Q;D263R;
D263S;D263T;D263V;D263W;D263Y;S264A;S264C;S264D;S264E;S264F;S264
G;S264H;S264I;S264K;S264L;S264M;S264N;S264P;S264Q;S264R;S264T;S26
4V;S264W;S264Y;I265A;I265C;I265D;I265E;I265F;I265G;I265H;I265K;I265L;I26
5M;I265N;I265P;I265Q;I265R;I265S;I265T;I265V;I265W;I265Y;G266A;G266C;G
266D;G266E;G266F;G266H;G266I;G266K;G266L;G266M;G266N;G266P;G266
Q;G266R;G266S;G266T;G266V;G266W;G266Y;K267A;K267C;K267D;K267E;K
267F;K267G;K267H;K267I;K267L;K267M;K267N;K267P;K267Q;K267R;K267S;
K267T;K267V;K267W;K267Y;I268A;I268C;I268D;I268E;I268F;I268G;I268H;I268
K;I268L;I268M;I268N;I268P;I268Q;I268R;I268S;I268T;I268V;I268W;I268Y;L269
A;L269C;L269D;L269E;L269F;L269G;L269H;L269I;L269K;L269M;L269N;L269P;
L269Q;L269R;L269S;L269T;L269V;L269W;L269Y;E270A;E270C;E270D;E270F;
E270G;E270H;E270I;E270K;E270L;E270M;E270N;E270P;E270Q;E270R;E270S
;E270T;E270V;E270W;E270Y;L271A;L271C;L271D;L271E;L271F;L271G;L271H
;L271I;L271K;L271M;L271N;L271P;L271Q;L271R;L271S;L271T;L271V;L271W;L
271Y;L272A;L272C;L272D;L272E;L272F;L272G;L272H;L272I;L272K;L272M;L27
2N;L272P;L272Q;L272R;L272S;L272T;L272V;L272W;L272Y;Q273A;Q273C;Q2
73D;Q273E;Q273F;Q273G;Q273H;Q273I;Q273K;Q273L;Q273M;Q273N;Q273P;
Q273R;Q273S;Q273T;Q273V;Q273W;Q273Y;D274A;D274C;D274E;D274F;D27
4G;D274H;D274I;D274K;D274L;D274M;D274N;D274P;D274Q;D274R;D274S;D
274T;D274V;D274W;D274Y;L275A;L275C;L275D;L275E;L275F;L275G;L275H;L
275I;L275K;L275M;L275N;L275P;L275Q;L275R;L275S;L275T;L275V;L275W;L2
75Y;H276A;H276C;H276D;H276E;H276F;H276G;H276I;H276K;H276L;H276M;H
276N;H276P;H276Q;H276R;H276S;H276T;H276V;H276W;H276Y;V277A;V277
C;V277D;V277E;V277F;V277G;V277H;V277I;V277K;V277L;V277M;V277N;V27
7P;V277Q;V277R;V277S;V277T;V277W;V277Y;A278C;A278D;A278E;A278F;A2
78G;A278H;A278I;A278K;A278L;A278M;A278N;A278P;A278Q;A278R;A278S;A
278T;A278V;A278W;A278Y;D279A;D279C;D279E;D279F;D279G;D279H;D279I;

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5M;P305N;P305Q;P305R;P305S;P305T;P305V;P305W;P305Y;F306A;F306C;F306D;F306E;F306G;F306H;F306I;F306K;F306L;F306M;F306N;F306P;F306Q;F306R;F306S;F306T;F306V;F306W;F306Y;L307A;L307C;L307D;L307E;L307F;L307G;L307H;L307I;L307K;L307M;L307N;L307P;L307Q;L307R;L307S;L307T;L307V;L307W;L307Y;C308A;C308D;C308E;C308F;C308G;C308H;C308I;C308K;C308L;C308M;C308N;C308P;C308Q;C308R;C308S;C308T;C308V;C308W;C308Y;G309A;G309C;G309D;G309E;G309F;G309H;G309I;G309K;G309L;G309M;G309N;G309P;G309Q;G309R;G309S;G309T;G309V;G309W;G309Y;K310A;K310C;K310D;K310E;K310F;K310G;K310H;K310I;K310L;K310M;K310N;K310P;K310Q;K310R;K310S;K310T;K310V;K310W;K310Y;Q311A;Q311C;Q311D;Q311E;Q311F;Q311G;Q311H;Q311I;Q311K;Q311L;Q311M;Q311N;Q311P;Q311R;Q311S;Q311T;Q311V;Q311W;Q311Y;T312A;T312C;T312D;T312E;T312F;T312G;T312H;T312I;T312K;T312L;T312M;T312N;T312P;T312Q;T312R;T312S;T312V;T312W;T312Y;T313A;T313C;T313D;T313E;T313F;T313G;T313H;T313I;T313K;T313L;T313M;T313N;T313P;T313Q;T313R;T313S;T313V;T313W;T313Y;F314A;F314C;F314D;F314E;F314G;F314H;F314I;F314K;F314L;F314M;F314N;F314P;F314Q;F314R;F314S;F314T;F314V;F314W;F314Y;E315A;E315C;E315D;E315F;E315G;E315H;E315I;E315K;E315L;E315M;E315N;E315P;E315Q;E315R;E315S;E315T;E315V;E315W;E315Y;G316A;G316C;G316D;G316E;G316F;G316H;G316I;G316K;G316L;G316M;G316N;G316P;G316Q;G316R;G316S;G316T;G316V;G316W;G316Y;G317A;G317C;G317D;G317E;G317F;G317H;G317I;G317K;G317L;G317M;G317N;G317P;G317Q;G317R;G317S;G317T;G317V;G317W;G317Y;M318A;M318C;M318D;M318E;M318F;M318G;M318H;M318I;M318K;M318L;M318N;M318P;M318Q;M318R;M318S;M318T;M318V;M318W;M318Y;R319A;R319C;R319D;R319E;R319F;R319G;R319H;R319I;R319K;R319L;R319M;R319N;R319P;R319Q;R319S;R319T;R319V;R319W;R319Y;E320A;E320C;E320D;E320F;E320G;E320H;E320I;E320K;E320L;E320M;E320N;E320P;E320Q;E320R;E320S;E320T;E320V;E320W;E320Y;P321A;P321C;P321D;P321E;P321F;P321G;P321H;P321I;P321K;P321L;P321M;P321N;P321Q;P321R;P321S;P321T;P321V;P321W;P321Y;A322C;A322D;A322E;A322F;A322G;A322H;A322I;A322K;A322L;A322M;A322N;A322P;A322Q;A322R;A322S;A322T;A322V;A322W;A322Y;L323A;L323C;L323D;L323E;L323F;L323G;L323H;L323I;L323K;L323M;L323N;L323P;L323Q;L323R;L323S;L323T;L323V;L323W;L323Y;A324C;A324D;A324E;A324F;A324G;A324H;A324I;A324K;A324L;A324M;A324N;A324P;A324Q;A324R;A324S;A324T;A324V;A324W;A324Y;W325A;W325C;W325D;W325E;W325F;W325G;W325H;W325I;W325K;W325L;W325M;W325N;W325P;W325Q;W325R;W325S;W325T;W325V;W325Y;W326A;W326C;W326D;W326E;W326F;W326G;W326H;W326I;W326K;W326L;W326M;W326N;W326P;W326Q;W326R;W326S;W326T;W326V;W326Y;P327A;P327C;P327D;P327E;P327F;P327G;P327H;P327I;P327K;P327L;P327M;P327N;P327Q;P327R;P327S;P327T;P327V;P327W;P327Y;G328A;G328C;G328D;G328E;G328F;G328H;G328I;G328K;G328L;G328M;G328N;G328P;G328Q;G328R;G328S;G328T;G328V;G328W;G328Y;H329A;H329C;H329D;H329E;H329F;H329G;H329I;H329K;H329L;H329M;H329N;H329P;H329Q;H329R;H329S;H329T;H329V;H329W;H329Y;V330A;V330C;V330D;V330E;V330F;V330G;V330H;V330I;V330K;V330L;V330M;V330N;V330P;V330Q;V330R;V330S;V330T;V330W;V330Y;T331A;T331C;T331D;T331E;T331F;T331G;T331H;T331I;T331

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V;C489W;C489Y;N490A;N490C;N490D;N490E;N490F;N490G;N490H;N490I;N4
90K;N490L;N490M;N490P;N490Q;N490R;N490S;N490T;N490V;N490W;N490Y;
W491A;W491C;W491D;W491E;W491F;W491G;W491H;W491I;W491K;W491L;
W491M;W491N;W491P;W491Q;W491R;W491S;W491T;W491V;W491Y;A492C;
A492D;A492E;A492F;A492G;A492H;A492I;A492K;A492L;A492M;A492N;A492P;
A492Q;A492R;A492S;A492T;A492V;A492W;A492Y;V493A;V493C;V493D;V493
E;V493F;V493G;V493H;V493I;V493K;V493L;V493M;V493N;V493P;V493Q;V49
3R;V493S;V493T;V493W;V493Y;M494A;M494C;M494D;M494E;M494F;M494G;
M494H;M494I;M494K;M494L;M494N;M494P;M494Q;M494R;M494S;M494T;M4
94V;M494W;M494Y;N495A;N495C;N495D;N495E;N495F;N495G;N495H;N495I;
N495K;N495L;N495M;N495P;N495Q;N495R;N495S;N495T;N495V;N495W;N49
5Y;W496A;W496C;W496D;W496E;W496F;W496G;W496H;W496I;W496K;W496
L;W496M;W496N;W496P;W496Q;W496R;W496S;W496T;W496V;W496Y;A497
C;A497D;A497E;A497F;A497G;A497H;A497I;A497K;A497L;A497M;A497N;A49
7P;A497Q;A497R;A497S;A497T;A497V;A497W;A497Y;P498A;P498C;P498D;P
498E;P498F;P498G;P498H;P498I;P498K;P498L;P498M;P498N;P498Q;P498R;
P498S;P498T;P498V;P498W;P498Y;P499A;P499C;P499D;P499E;P499F;P499
G;P499H;P499I;P499K;P499L;P499M;P499N;P499Q;P499R;P499S;P499T;P49
9V;P499W;P499Y;G500A;G500C;G500D;G500E;G500F;G500H;G500I;G500K;G
500L;G500M;G500N;G500P;G500Q;G500R;G500S;G500T;G500V;G500W;G50
0Y;C501A;C501D;C501E;C501F;C501G;C501H;C501I;C501K;C501L;C501M;C5
01N;C501P;C501Q;C501R;C501S;C501T;C501V;C501W;C501Y;E502A;E502C;
E502D;E502F;E502G;E502H;E502I;E502K;E502L;E502M;E502N;E502P;E502Q
;E502R;E502S;E502T;E502V;E502W;E502Y;K503A;K503C;K503D;K503E;K503
F;K503G;K503H;K503I;K503L;K503M;K503N;K503P;K503Q;K503R;K503S;K50
3T;K503V;K503W;K503Y;L504A;L504C;L504D;L504E;L504F;L504G;L504H;L50
4I;L504K;L504M;L504N;L504P;L504Q;L504R;L504S;L504T;L504V;L504W;L504
Y;G505A;G505C;G505D;G505E;G505F;G505H;G505I;G505K;G505L;G505M;G5
05N;G505P;G505Q;G505R;G505S;G505T;G505V;G505W;G505Y;K506A;K506C
;K506D;K506E;K506F;K506G;K506H;K506I;K506L;K506M;K506N;K506P;K506
Q;K506R;K506S;K506T;K506V;K506W;K506Y;C507A;C507D;C507E;C507F;C5
07G;C507H;C507I;C507K;C507L;C507M;C507N;C507P;C507Q;C507R;C507S;
C507T;C507V;C507W;C507Y;L508A;L508C;L508D;L508E;L508F;L508G;L508H;
L508I;L508K;L508M;L508N;L508P;L508Q;L508R;L508S;L508T;L508V;L508W;L
508Y;T509A;T509C;T509D;T509E;T509F;T509G;T509H;T509I;T509K;T509L;T5
09M;T509N;T509P;T509Q;T509R;T509S;T509V;T509W;T509Y;P510A;P510C;P
510D;P510E;P510F;P510G;P510H;P510I;P510K;P510L;P510M;P510N;P510Q;
P510R;P510S;P510T;P510V;P510W;P510Y;P511A;P511C;P511D;P511E;P511
F;P511G;P511H;P511I;P511K;P511L;P511M;P511N;P511Q;P511R;P511S;P51
1T;P511V;P511W;P511Y;E512A;E512C;E512D;E512F;E512G;E512H;E512I;E5
12K;E512L;E512M;E512N;E512P;E512Q;E512R;E512S;E512T;E512V;E512W;
E512Y;S513A;S513C;S513D;S513E;S513F;S513G;S513H;S513I;S513K;S513L;
S513M;S513N;S513P;S513Q;S513R;S513T;S513V;S513W;S513Y;I514A;I514C;
I514D;I514E;I514F;I514G;I514H;I514K;I514L;I514M;I514N;I514P;I514Q;I514R;I5

14S;I514T;I514V;I514W;I514Y;P515A;P515C;P515D;P515E;P515F;P515G;P515H;P515I;P515K;P515L;P515M;P515N;P515Q;P515R;P515S;P515T;P515V;P515W;P515Y;K516A;K516C;K516D;K516E;K516F;K516G;K516H;K516I;K516L;K516M;K516N;K516P;K516Q;K516R;K516S;K516T;K516V;K516W;K516Y;K517A;K517C;K517D;K517E;K517F;K517G;K517H;K517I;K517L;K517M;K517N;K517P;K517Q;K517R;K517S;K517T;K517V;K517W;K517Y;C518A;C518D;C518E;C518F;C518G;C518H;C518I;C518K;C518L;C518M;C518N;C518P;C518Q;C518R;C518S;C518T;C518V;C518W;C518Y;L519A;L519C;L519D;L519E;L519F;L519G;L519H;L519I;L519K;L519M;L519N;L519P;L519Q;L519R;L519S;L519T;L519V;L519W;L519Y;W520A;W520C;W520D;W520E;W520F;W520G;W520H;W520I;W520K;W520L;W520M;W520N;W520P;W520Q;W520R;W520S;W520T;W520V;W520Y;S521A;S521C;S521D;S521E;S521F;S521G;S521H;S521I;S521K;S521L;S521M;S521N;S521P;S521Q;S521R;S521T;S521V;S521W;S521Y;H522A;H522C;H522D;H522E;H522F;H522G;H522I;H522K;H522L;H522M;H522N;H522P;H522Q;H522R;H522S;H522T;H522V;H522W;H522Y

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A2H	N/A	Deleterious	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A2I	N/A	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A2K	N/A	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A2L	N/A	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A2M	N/A	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A2N	N/A	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A2P	Neutral	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A2Q	N/A	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A2R	N/A	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A2S	Neutral	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A2T	Neutral	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A2V	Neutral	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A2W	N/A	Deleterious	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A2Y	N/A	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A3C	N/A	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A3D	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A3E	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
A3F	N/A	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A3G	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A3H	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A3I	N/A	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
A3K	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A3L	N/A	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
A3M	N/A	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A3N	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A3P	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A3Q	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A3R	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A3S	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A3T	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A3V	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A3W	N/A	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A3Y	N/A	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
V4A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V4C	N/A	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V4D	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V4E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
V4F	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V4G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
V4H	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V4I	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V4K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V4L	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V4M	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V4N	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V4P	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V4Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
V4R	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V4S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V4T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V4W	N/A	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
V4Y	N/A	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A6K	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A6L	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A6M	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A6N	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A6P	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A6Q	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A6R	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A6S	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A6T	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A6V	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A6W	N/A	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
A6Y	N/A	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
A7C	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A7D	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
A7E	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A7F	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A7G	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A7H	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A7I	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A7K	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A7L	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A7M	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A7N	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A7P	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
A7Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A7R	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
W11T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
W11V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
W11Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q12A	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12C	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12E	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12F	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12H	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12M	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12P	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12R	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12S	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q12T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12V	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q12W	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Q12Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L13A	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L13C	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
L13D	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L13E	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L13F	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L13G	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious
L13H	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L13I	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L13K	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
L13M	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L13N	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
L13P	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious
L13Q	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
L13R	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L13S	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L13T	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L13V	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L13W	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
L13Y	N/A	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L14A	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L14C	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L14D	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L14E	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L14F	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L14G	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
L14H	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L14I	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L14K	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L14M	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L14N	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L14P	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious
L14Q	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
L14R	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L14S	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L14T	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L14V	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L14W	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
L14Y	N/A	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L15A	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L15C	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L15D	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L15E	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
L15F	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L15G	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
L15H	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L15I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L15K	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L15M	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L15N	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L15P	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious
L15Q	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
L15R	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
L15S	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L15T	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L15V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L15W	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L15Y	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V16A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V16C	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
V16D	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
V16E	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
V16F	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V16G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V16H	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
V16I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V16K	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
V16L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V16M	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V16N	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V16P	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
V16Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V16R	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
V16S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V16T	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V16W	N/A	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
V16Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L17A	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L17C	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L17D	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
L17E	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L17F	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L17G	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L17H	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
L17I	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L17K	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L17M	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L17N	N/A	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L17P	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L17Q	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L17R	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L17S	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L17T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L17V	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L17W	N/A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
L17Y	N/A	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S18A	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S18C	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S18D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
S18E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
S18F	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S18G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S18H	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S18I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S18K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
S18L	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S18M	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
S18N	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S18P	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P28F	N/A	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious
P28G	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P28H	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
P28I	N/A	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
P28K	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P28L	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P28M	N/A	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
P28N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
P28Q	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
P28R	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
P28S	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P28T	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P28V	N/A	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P28W	N/A	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
P28Y	N/A	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
Q29A	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q29C	N/A	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
Q29D	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q29E	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q29F	N/A	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
Q29G	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q29H	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
Q29I	N/A	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q29K	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q29L	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q29M	N/A	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I33R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I33S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I33T	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I33V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
I33W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
I33Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
L34A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
L34C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L34D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L34E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L34F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L34G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L34H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L34I	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L34K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L34M	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L34N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L34P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L34Q	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L34R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L34S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L34T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L34V	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L34W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L34Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L35A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L35C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L35D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L35E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L35F	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L35G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L35H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L35I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L35K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L35M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L35N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L35P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L35Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L35R	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L35S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L35T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L35V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L35W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L35Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L36A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L36G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L36K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36M	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L36N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36Q	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L36V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L36W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L36Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L37A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L37C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L37D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L37E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L37F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L37G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L37H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L37I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L37K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L37M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L37N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L37P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L37Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L37R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L37S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L37T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L37V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L37W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
L37Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
M38A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
M38C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
M38D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M38E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M38F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
M38G	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M38H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M38I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
M38K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M38L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
M38N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M38P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
M38Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
M38R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M38S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
M38T	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
M38V	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
M38W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M38Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
D39A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D39C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D39E	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D39F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D39G	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D39H	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D39I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D39K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D39L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
D39M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D39N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D39P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D39Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D39R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D39S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
D40Y	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M41A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M41C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M41D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M41E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M41F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M41G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M41H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M41I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
M41K	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
M41L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
M41N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M41P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M41Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M41R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M41S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
M41T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M41V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
M41W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
M41Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G42A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
W43F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
W43G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
W43H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W43I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
W43K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W43L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
W43M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W43N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W43P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
W43Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
W43R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W43S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W43T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W43V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W43Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G44A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G44C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G44D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G44E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G44F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G44H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G44I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G44K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G44L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G44M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G44N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G44P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G44Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G44R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G44S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G44T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G44V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G44W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G44Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D45A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D45K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
D45N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
D45P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D45V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D45W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D45Y	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L46A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L46C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L46D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L46E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L46F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L46G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L46H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L46I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L46K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L46M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L46N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L46P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L46Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L46R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L46S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L46T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L46V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L46W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L46Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G47I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G47S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y49A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y49C	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y49D	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y49E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y49F	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
Y49G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y49H	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y49I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y49K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y49L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
Y49M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y49N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
Y49P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y49Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y49R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y49S	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y49T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y49V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y49W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G50E	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G50T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G50V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G50W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G50Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E51A	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E51C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E51D	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E51F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E51G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
E51H	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E51I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E51K	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E51L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
E51M	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E51N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E51P	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
E51Q	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E51R	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E51S	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E51T	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
E51V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E51W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E51Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
P52A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P52C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P52D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P52E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P52F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P52G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P52H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P52I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P52K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P52L	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P52M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P52N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P52Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P52R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P52S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P52T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P52V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P52W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P52Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S53A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S53C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S53D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
S53E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S53F	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
S53G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
S53H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
S53I	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S53K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S53L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
S53M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S53N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S53P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S53Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S53R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
S53T	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S53V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
S53W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
S53Y	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
R54A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
R54C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
R54D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
R54E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
R54F	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
R54G	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R54H	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
R54I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
R54K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
R54L	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
R54M	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
R54N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
R54P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
R54Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
R54S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
R54T	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
R54V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
R54W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R54Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E55A	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E55C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E55D	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
E55F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E55G	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E55H	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
E55I	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E55K	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
E55L	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E55M	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E55N	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
E55P	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E55Q	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
E55R	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
E55S	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
E55T	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
E55V	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E55W	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E55Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T56F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56I	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T56P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T56S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T56W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T56Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57E	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57H	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P57I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57K	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57L	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57Q	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P57R	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P57T	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P57W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P57Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N58A	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N58C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N58D	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N58E	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N58F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N58G	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N58H	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
N58I	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N58K	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N58L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N58M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N58P	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N58Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N58R	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
N58S	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N58T	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N58V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N58W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N58Y	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L59A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L59C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L59D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L59E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L59F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L59G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L59H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L59I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L59K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L59M	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L59N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L59P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L59Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
D60V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D60W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D60Y	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R61A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
R61C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R61D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R61E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
R61F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R61G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
R61H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
R61I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R61K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R61L	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
R61M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R61N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
R61P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R61Q	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
R61S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
R61T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R61V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R61W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R61Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M62A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
M62C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M62D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M62E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M62F	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
M62G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M62H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M62I	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M62K	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M62L	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M62N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M62P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M62Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M62R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M62S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
M62T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
M62V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M62W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
M62Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A63C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A63D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A63E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A63F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A63G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A63H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A63I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A63K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A63L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A63M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A63N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A63P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A63Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A63R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A63S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A63T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A63V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A63W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A63Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A64C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
A64D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
A64E	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A64F	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A64G	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A64H	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A64I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A64K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
A64L	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
A64M	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A64N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A64P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
A64Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
A64R	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
A64S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A64T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A64V	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
A64W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
A64Y	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E65A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E65C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E65D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
E65F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E65G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E65H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E65I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E65K	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E65L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E65M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E65N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E65P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E65Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E65R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E65S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E65T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E65V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E65W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E65Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G66A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G66C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G66D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G66E	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G66F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G66H	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G66I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G66K	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G66L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G66M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G66N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G66P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G66Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L67Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
L68A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L68C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L68D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L68E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
L68F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L68G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L68H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L68I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L68K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L68M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L68N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L68P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L68Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L68R	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L68S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
L68T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L68V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L68W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L68Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
F69A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F69G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69I	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
F69M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F69P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F69V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F69W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
F69Y	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
P70A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P70C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P70D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P70E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P70F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P70G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P70H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P70I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P70K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P70L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
P70M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P70N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P70Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P70R	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P70S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
P70T	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
P70V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P70W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P70Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N71A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N71C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N71D	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
N71E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
N71F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N71G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
N71H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N71I	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N71K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N71L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N71M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N71P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N71Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
N71R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N71S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
N71T	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N71V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N71W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N71Y	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F72R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F72Y	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Y73A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y73F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y73M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y73T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y73V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y73W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S74A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S74C	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S74D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S74E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S74F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S74G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S74H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S74I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S74K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S74L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S74M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S74N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S74P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S74Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S74R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S74T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
S74V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S74W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S74Y	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A75C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A75D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A75E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
A75F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A75G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A75H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A75I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A75K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A75L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A75M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A75N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
A75P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A75Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A75R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A75S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A75T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A75V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A75W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A75Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N76A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
N76C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N76D	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
N76E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
N76F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N76G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N76H	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N76I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N76K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N76L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N76M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N76P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N76Q	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N76R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N76S	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
N76T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
N76V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N76W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N76Y	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P77A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P77C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P77D	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P77E	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P77F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P77G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P77H	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P77I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P77K	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P77L	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P77M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P77N	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P77Q	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P77R	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P77S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P77T	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P77V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P77W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P77Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L78A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L78C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L78D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L78E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L78F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L78G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L78H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L78I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L78K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L78M	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L78N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L78P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L78Q	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L78R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L78S	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L78T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L78V	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L78W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L78Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
C79A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79G	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C79H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C79K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
C79S	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
C79T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C79W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C79Y	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S80A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
S80C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S80D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S80E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S80F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S80G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S80H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S80I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S80K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S80L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S80M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S80N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
S80P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S80Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S80R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S80T	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S80V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R83F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R83G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R83H	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R83I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R83K	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R83L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R83M	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R83N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R83P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R83Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R83S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R83T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R83V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R83W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R83Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84E	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A84K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A84S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A84T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A84V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A84W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A84Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A85C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A85H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A85N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A85T	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A85V	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A85W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A85Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
L86G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L86K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86M	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L86N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86Q	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L86R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L86V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L86W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L86Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87F	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87I	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L87K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L87N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L87T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R90E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R90F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R90G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R90H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R90I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R90K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R90L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R90M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R90N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R90P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R90Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R90S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R90T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R90V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R90W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R90Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L91A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L91C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L91D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L91E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L91F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L91G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P92L	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P92M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P92N	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P92Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P92R	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P92S	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P92T	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P92V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P92W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P92Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
I93A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I93C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I93D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I93E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I93F	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I93G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I93H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I93K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I93L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I93M	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
I93N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I93P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I93Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I93R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I93S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I93T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I93V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I93W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
I93Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
R94A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R94C	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R94D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R94E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R94F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R94G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R94H	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R94I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R94K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R94L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R94M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R94N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R94P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R94Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R94S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R94T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R94V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R94W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R94Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N95A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N95C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N95D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N95E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N95F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N95G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N95H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
N95I	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N95K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N95L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N95M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N95P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N95Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N95R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N95S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
N95T	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
N95V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N95W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N95Y	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G96A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G96C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G96D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G96E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G96F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G96H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G96I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G96K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G96L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G96M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G96N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G96P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G96Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G96R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G96S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G96T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G96V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G96W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G96Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F97A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F97D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
F97K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
F97M	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
F97N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97V	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
F97W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F97Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
Y98A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y98C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y98D	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y98E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y98F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y98G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y98H	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y98I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y98K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y98L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y98M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y98N	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y98P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y98Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y98R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y98S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y98T	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y98V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y98W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
T99A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T99C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T99D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T99E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T99F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T99G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T99H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T99I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T99K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T99L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T99M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T99N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T99P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T99Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T99R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T99S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T99V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T99W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T99Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T100A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T100C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T100D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
T100E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T100F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T100G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T100H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T100I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T100K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T100L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T100M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T100N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T100P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T100Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T100R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T100S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T100V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T100W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T100Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N101A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N101C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N101D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N101E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N101F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N101G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N101H	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N101I	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N101K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
N101L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N101M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N101P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N101Q	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N101R	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N101S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
N101T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N101V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N101W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N101Y	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A102C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A102D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A102E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A102F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A102G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A102H	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
A102I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A102K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A102L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A102M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A102N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A102P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A102Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A102R	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A102S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A102T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A102V	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A102W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
A102Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
H103A	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H103C	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H103D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H103E	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
H103F	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H103G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H103I	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H103K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
H103L	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H103M	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H103N	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H103P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H103Q	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
H103R	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H103S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H103T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H103V	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H103W	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H103Y	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A104C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
A104D	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A104E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A104F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R105K	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
R105L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R105M	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
R105N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R105P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
R105Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
R105S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
R105T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R105V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R105W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
R105Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N106A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N106C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N106D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N106E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N106F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N106G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N106H	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
N106I	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N106K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
N106L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N106M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N106P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N106Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N106R	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
N106S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
N106T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N106V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N106W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N106Y	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A107C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
A107D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A107E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
A107F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A107G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A107H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
A107I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A107K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A107L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A107M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
A107N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
A107P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A107Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A107R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
A107S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A107T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A107V	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A107W	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
A107Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Y108A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y108C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y108D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y108E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y108F	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Y108G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y108H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y108I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y108K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y108L	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y108M	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y108N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y108P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y108Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y108R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y108S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y108T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y108V	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y108W	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
T109A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T109C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T109D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T109E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T109F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T109G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T109H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T109I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T109K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T109L	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T109M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T109N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T109P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T109Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T109R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T109S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T109V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T109W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
T109Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
P110A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P110C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P110D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P110E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P110F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P110G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P110H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P110I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P110K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P110L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P110M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P110N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P110Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P110R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P110S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P110T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P110V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P110W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P110Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Q111A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q111C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q111D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
Q111E	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q111F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Q111G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q111H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q111I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q111K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
Q111L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q111M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Q111N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
Q111P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q111R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
Q111S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q111T	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q111V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q111W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Q111Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
E112A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E112C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
E112D	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E112F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E112G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E112H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E112I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
E112K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E112L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
E112M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E112N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E112P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I113W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
I113Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
V114A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V114C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V114D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V114E	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V114F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V114G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V114H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V114I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V114K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V114L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V114M	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V114N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V114P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V114Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V114R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
V114S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V114T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V114W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
V114Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
G115A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G115C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G115D	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G116I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G116K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G116L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G116M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G116N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G116P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G116Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G116R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G116S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G116T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G116V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G116W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G116Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
I117A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117L	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I117M	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
I117N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I117Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I117V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
I117W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
I117Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P118A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P118C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P118D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P118E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P118F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P118G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P118H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P118I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P118K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P118L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P118M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P118N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P118Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P118R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P118S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
P118T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P118V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P118W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P118Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D119A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
D119C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
D119E	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D119F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D119G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
D119H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D119I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D119K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
D119L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D119M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
D119N	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
D119P	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
D119Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D119R	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D119S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D119T	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
D119V	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
D119W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D119Y	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S120A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S120C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S120D	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S120E	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S120F	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S120G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S120H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
S120I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S120K	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S120L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
S120M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S120N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S120P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
S120Q	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S120R	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S120T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S120V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
S120W	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
S120Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
E121A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q122F	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q122G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q122H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q122I	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q122K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q122L	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q122M	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q122N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q122P	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q122R	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q122S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q122T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q122V	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q122W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q122Y	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L123A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L123C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L123D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L123E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L123F	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L123G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L123H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L123I	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L123K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L123M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L123N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L123P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L123Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L123R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L123S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L123T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L123V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L123W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L123Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L124A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L124C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L124D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L124E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L124F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L124G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L124H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L124I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L124K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L124M	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L124N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L124P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L124Q	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L124R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P125W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P125Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E126A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
E126C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E126D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
E126F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E126G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E126H	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E126I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E126K	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E126L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E126M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E126N	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E126P	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E126Q	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
E126R	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E126S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
E126T	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E126V	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E126W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E126Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L127A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L127C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L127D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L127E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L127F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
L127G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L127H	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L127I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L127K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L127M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L127N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L127P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L127Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L127R	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L127S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L127T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L127V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L127W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L127Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L128A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L128C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L128D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L128E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L128F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L128G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L128H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L128I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L128K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L128M	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L128N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L128P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L128Q	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L128R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L128S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L128T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L128V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L128W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L128Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K129A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
K129C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K129D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K129E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K129F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K129G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K129H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
K129I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K129L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
K129M	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K129N	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious
K129P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K129Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K129R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
K129S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K129T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K129V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K129W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K129Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K130A	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K130C	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
K130D	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
K130E	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K130F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K130G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
K130H	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
K130I	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
K130L	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
K130M	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G132Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y133A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y133F	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y133V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y133W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V134A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
V134C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V134D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
V134E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V134F	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V134G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V134H	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V134I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V134K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V134L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V134M	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V134N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V134P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V134Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V134R	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V134S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V134T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
V134W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
V134Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
S135A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
S135C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S135D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
S135E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
S135F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S135G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
S135H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S135I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S135K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
S135L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S135M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S135N	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
S135P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S135Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
S135R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S135T	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
S135V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S135W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S135Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
K136A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
K136C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
K136D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K136E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
K136F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
K136G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
K136H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K136I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K136L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
K136M	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
K136N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
K136P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K136Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
K136R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
K136S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
K136T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
K136V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K136W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K136Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I137A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I137C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
I137D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I137E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I137F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
I137G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I137H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I137K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I137L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I137M	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
I137N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I137P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I137Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I137R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I137S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I137T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I137V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
I137W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
I137Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V138A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V138C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V138D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V138E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V138F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V138G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V138H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V138I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
V138K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V138L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
V138M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
V138N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V138P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V138Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V138R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V138S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V138T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H142D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H142E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H142F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H142G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H142I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H142K	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H142L	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H142M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H142N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H142P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H142Q	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H142R	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H142S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H142T	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H142V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H142W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H142Y	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L143A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L143C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L143D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L143E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L143F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L143G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L143H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L143I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L143K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L143M	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L143N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L143P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L143Q	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L143R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L143S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L143T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L143V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L143W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L143Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G144A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G144C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G144D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G144E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G144F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G144H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G144I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G144K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G144L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G144M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G144N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G144P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G144Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G144R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G144S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G144T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G144V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G144W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G144Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H145A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H145C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H145D	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H145E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H145F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H145G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H145I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H145K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H145L	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H145M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H145N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R146S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
R146T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R146V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
R146W	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R146Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P147A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
P147C	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P147D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P147E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
P147F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P147G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P147H	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P147I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P147K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P147L	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P147M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P147N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P147Q	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P147R	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P147S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P147T	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P147V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P147W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P147Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Q148A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q148C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Q148D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q148E	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
Q148F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q148G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q148H	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Q148I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q148K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
Q148L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q148M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q148N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q148P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q148R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q148S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
Q148T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q148V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q148W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Q148Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F149A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F149C	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F149D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F149E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F149G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F149H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F149I	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F149K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F149L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F149M	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F149N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F149P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F149Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F149R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F149S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F149T	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F149V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F149W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
F149Y	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
H150A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
H150C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H150D	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H150E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
H150F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H150G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H150I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
H150K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
H150L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious
H150M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
H150N	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
H150P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
H150Q	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
H150R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
H150S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
H150T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
H150V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
H150W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H150Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
P151A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151E	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151K	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P151L	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P151Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151R	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P151V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P151W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P151Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
L152A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
L152C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L152D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L152E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L152F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L152G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L152H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L152I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L152K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L152M	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L152N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L152P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L152Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L152R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L152S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L152T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L152V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L152W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L152Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
K153A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K153C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
K153D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K153E	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K153F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
K153G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
K153H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K153I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
K153L	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
K153M	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
K153N	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
K153P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
K153Q	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K153R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K153S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K153T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
K153V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K153W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K153Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
H154A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H154C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H154D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H154E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H154F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H154G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H154I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H154K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H154L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H154M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H154N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious
H154P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
H154Q	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H154R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
H154S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H154T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H154V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H154W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H154Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
D157F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D157G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
D157H	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D157I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D157K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D157L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D157M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D157N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D157P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D157Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D157R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D157S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D157T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D157V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D157W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D157Y	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
E158A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E158C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
E158D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E158F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E158G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
E158H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
W159L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
W159M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
W159N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
W159P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W159Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W159R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
W159S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W159T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W159V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W159Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
F160A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F160C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F160D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F160E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F160G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F160H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F160I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F160K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F160L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
F160M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F160N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F160P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G161T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G161V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G161W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G161Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
S162A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S162C	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162F	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S162H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162L	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162M	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S162P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S162W	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
S162Y	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
P163A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P163D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P163G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P163L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P163Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P163W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P163Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N164A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N164C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N164D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
N164E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N164F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N164G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N164H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
N164I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N164K	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N164L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N164M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N164P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N164Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
N164R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N164S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
N164T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N164V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N164W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N164Y	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
C165A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
C165D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C165E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C165F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C165G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
C165H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
C165I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C165K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
C165L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
C165M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
C165N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
C165P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
C165Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
C165R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
C165S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C165T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
C165V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
C165W	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
C165Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
H166A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H166C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H166D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H166E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H166F	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H166G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H166I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H166K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H166L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H166M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H166N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H166P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H166Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H166R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H166S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H166T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H166V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H166W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H166Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
F167A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F167C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F167D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
F167E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F167G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F167H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F167I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F167K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
F167L	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
F167M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F167N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F167P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F167Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
F167R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F167S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F167T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F167V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F167W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
F167Y	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
G168A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G168C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G168D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G168E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G168F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G168H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G168I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G168K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G168L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G168M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G168N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
G168P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G168Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G168R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G168S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G168T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G168V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G168W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G168Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P169A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P169C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P169D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P169E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P169F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P169G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P169H	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P169I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P169K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P169L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P169M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P169N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P169Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P169R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P169S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P169T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P169V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P169W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P169Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y170A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y170C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y170D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y170E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y170F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Y170G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y170H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y170I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y170K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y170L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y170M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y170N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y170P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y170Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y170R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y170S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y170T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y170V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y170W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
D171A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D171C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
D171E	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
D171F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D171G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D171H	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
D171I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
D171K	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
D171L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D171M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D171N	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
D171P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
D171Q	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
D171R	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D171S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
D171T	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
D171V	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D171W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D171Y	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N172A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N172C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N172D	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
N172E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
N172F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N172G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
N172H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
N172I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N172K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
N172L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N172M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N172P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N172Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
N172R	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N172S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N172T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N172V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N172W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N172Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
K173A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
K173C	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
K173D	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
K173E	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
K173F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
K173G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
K173H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
K173I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
K173L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
K173M	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
K173N	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K173P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
K173Q	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K173R	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K173S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K173T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K173V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K173W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K173Y	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A174C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A174D	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A174E	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A174F	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A174G	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A174H	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A174I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A174K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A174L	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A174M	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R175W	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
R175Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
P176A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P176C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P176D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P176E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P176F	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P176G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P176H	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P176I	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P176K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P176L	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P176M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P176N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P176Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P176R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P176S	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P176T	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P176V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P176W	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P176Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N177A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N177C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N177D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N177E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N177F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N177G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N177H	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N177I	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N177K	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N177L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N177M	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N177P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N177Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N177R	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N177S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N177T	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N177V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N177W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N177Y	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I178A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I178C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I178D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I178E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I178F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I178G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I178H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I178K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I178L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I178M	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I178N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I178P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I178Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I178R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I178S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I178T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I178V	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
I178W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
I178Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P179A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P179C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P179D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P179E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P179F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P179G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P179H	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V180M	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V180N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V180P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V180Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V180R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V180S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V180T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V180W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V180Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y181A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y181C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y181D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y181E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y181F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Y181G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y181H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y181I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y181K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y181L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y181M	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y181N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y181P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y181Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y181R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y181S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y181T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y181V	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y181W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
R182A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
R182C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R182D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
R182E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R182F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R182G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R182H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
R182I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R182K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R182L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
R182M	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R182N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R182P	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R182Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R182S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
R182T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R182V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E185L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious
E185M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E185N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
E185P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E185Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E185R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
E185S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E185T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious
E185V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E185W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious
E185Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M186A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M186C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M186D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M186E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M186F	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M186G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M186H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M186I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
M186K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M186L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
M186N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
M186P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M186Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M186R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M186S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
M186T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
M186V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
M186W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
M186Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V187A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V187C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V187D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V187E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V187F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V187G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V187H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V187I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V187K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
V187L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
V187M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V187N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V187P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V187Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V187R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V187S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V187T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
V187W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V187Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G188A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G188C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G188D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G188E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
G188F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G188H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G188I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G188K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G188L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G188M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G188N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G188P	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G188Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G188R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G188S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G188T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G188V	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G188W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G188Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R189A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
R189C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R189D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R189E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R189F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R189G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R189H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R189I	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R189K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
R189L	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
R189M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R189N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R189P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R189Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
R189S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
R189T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R189V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
R189W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R189Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y190A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y190C	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y190D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Y190E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Y190F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Y190G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Y190H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y190I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y190K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Y190L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Y190M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y190N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Y190P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Y190Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y190R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y190S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y190T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y190V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y190W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y191A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
Y191C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y191D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Y191E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y191F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Y191G	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y191H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y191I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y191K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y191L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
Y191M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y191N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y191P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Y191Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y191R	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y191S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y191T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y191V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y191W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E192A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
E192C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E192D	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
E192F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E192G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E192H	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral
E192I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E192K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
E192L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E192M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E192N	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
E192P	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E192Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
E192R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
E192S	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E192T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
E192V	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E192W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E192Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E193A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E193C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E193D	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
E193F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E193G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E193H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E193I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E193K	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E193L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E193M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E193N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E193P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
E193Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E193R	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
E193S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E193T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
E193V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E193W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E193Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F194A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
F194C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F194D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F194E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F194G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F194H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F194I	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
F194K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F194L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
F194M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
F194N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F194P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F194Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F194R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I196A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
I196C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I196D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I196E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I196F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I196G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I196H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I196K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I196L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
I196M	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
I196N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
I196P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I196Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I196R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I196S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I196T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I196V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
I196W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
I196Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N197A	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
N197C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N197D	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
N197E	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
K199T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
K199V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
K199W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K199Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T200A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T200C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T200D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T200E	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T200F	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T200G	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T200H	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
T200I	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T200K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
T200L	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T200M	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T200N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T200P	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T200Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T200R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T200S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T200V	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T200W	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T200Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G201A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
G201C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201D	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201E	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201H	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201K	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201M	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
G201P	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
G201Q	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201R	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G201V	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral
G201W	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G201Y	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
E202A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
E202C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A203K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
A203L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
A203M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
A203N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
A203P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
A203Q	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
A203R	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A203S	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A203T	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A203V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious
A203W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
A203Y	N/A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
N204A	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N204C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N204D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
N204E	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
N204F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N204G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N204H	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N204I	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N204K	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N204L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N204M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N204P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
N204Q	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
N204R	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
N204S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N204T	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N204V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N204W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N204Y	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L205A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L205C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
L205D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L205E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L205F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
L205G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L205H	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L205I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L205K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L205M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L205N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L205P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L205Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L205R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L205S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
L205T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L205V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L205W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L205Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T206A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
T206C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T206D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T206E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T206F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T206G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T206H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T206I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T206K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T206L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
T206M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T206N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T206P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T206Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T206R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T206S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T206V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T206W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T206Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q207A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
Q207C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
Q207D	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q207E	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Q207F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q207G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q207H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q207I	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q207K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Q207L	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q207M	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q207N	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Q207P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q207R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q207S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q207T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q207V	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
Q207W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Q207Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I208A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I208C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I208D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
I208E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
I208F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I208G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
I208H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
I208K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
I208L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I208M	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I208N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
I208P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
I208Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
I208R	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
I208S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I208T	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I208V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I208W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
I208Y	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral
Y209A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y209C	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
Y209D	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y209E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Y209F	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
Y209G	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y209H	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y209I	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y209K	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y209L	N/A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
Y209M	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y209N	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y209P	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y209Q	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y209R	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y209S	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
Y209T	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y209V	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y209W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L210A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L210C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L210D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
L210E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L210F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L210G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L210H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L210I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L210K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L210M	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L210N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L210P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
L210Q	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L210R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L210S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L210T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L210V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L210W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L210Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q211A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
Q211C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q211D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q211E	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Q211F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
Q211G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
Q211H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q211I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
Q211K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q211L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
Q211M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
Q211N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
Q211P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q211R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q211S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q211T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q211V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
Q211W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q211Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E212A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E212C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
E212D	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E212F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
E212G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E212H	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E212I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E212K	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E212L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E212M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E212N	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E212P	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
E212Q	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E212R	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
E212S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
E212T	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E212V	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E212W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E212Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A213C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
A213D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A213E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A213F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A213G	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
A213H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A213I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A213K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A213L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A213M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A213N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A213P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A213Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A213R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A213S	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A213T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
A213V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
A213W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A213Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L214A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L214C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L214D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L214E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L214F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L214G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L214H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L214I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L214K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L214M	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L214N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L214P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L214Q	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L214R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L214S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L214T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L214V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L214W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L214Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
D215A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
D215C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D215E	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
D215F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D215G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
D215H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
D215I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D215K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
D215L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
D215M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D215N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
D215P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D215Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D215R	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D215S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
D215T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
D215V	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
D215W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D215Y	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F216L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F216M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F216P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
F216S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F216W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
F216Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
I217A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
I217C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I217D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I217E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I217F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I217G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I217H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I217K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I217L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I217M	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
I217N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I217P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I217Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I217R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I217S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I217T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I217V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
I217W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
I217Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
K218A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
K218C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
K218D	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K218E	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
K218F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
K218G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
K218H	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
K218I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
K218L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
K218M	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
K218N	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
K218P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
K218Q	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K218R	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K218S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K218T	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
K218V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R222S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
R222T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
R222V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
R222W	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
R222Y	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
H223A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
H223C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
H223D	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
H223E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
H223F	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
H223G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
H223I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
H223K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
H223L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
H223M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
H223N	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
H223P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
H223Q	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
H223R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
H223S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
H223T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
H223V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
H223W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H223Y	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
H224A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H224C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H224D	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
H224E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
H224F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H224G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious
H224I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H224K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
H224L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious
H224M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
H224N	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
H224P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
H224Q	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
H224R	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
H224S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
H224T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
H224V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
H224W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H224Y	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
P225A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P225C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P225D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P225E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P225F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P225G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P225H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P225I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P225K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P225L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P225M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P225N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P225Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P225R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
P225S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P225T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P225V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P225W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P225Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F226A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F226C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F226D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F226E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F226G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F226H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F226I	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F226K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F226L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F227Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F227R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F227S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F227T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F227V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F227W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F227Y	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L228A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L228C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L228D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L228E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L228F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L228G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L228H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L228I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L228K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L228M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L228N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L228P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L228Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L228R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L228S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L228T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L228V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L228W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L228Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y229A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
Y229C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y229D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y229E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y229F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
Y229G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y229H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y229I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
Y229K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y229L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
Y229M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y229N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y229P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y229Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y229R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y229S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y229T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y229V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y229W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W230A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
W230C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W230D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W230E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
W230F	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W230G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W230H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
W230I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W230K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
W230L	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
W230M	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W230N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W230P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W230Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W230R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W230S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W230T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
W230V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W230Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
A231C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A231D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A231E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
A231F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
A231G	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A231H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A231I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A231K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A231L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A231M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A231N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A231P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
A231Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A231R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
A231S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A231T	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
A231V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A231W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A231Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V232A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V232C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
V232D	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
V232E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
V232F	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V232G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V232H	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
V232I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V232K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
V232L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V232M	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
V232N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
V232P	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
V232Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
V232R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
V232S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V232T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V232W	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
V232Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
D233A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
D233C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
D233E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
D233F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
D233G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
D233H	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D233I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
D233K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D233L	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D233M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D233N	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
D233P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
D233Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
D233R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D233S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
D233T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
D233V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D233W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D233Y	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A234C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
A234D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A234E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A234F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A234G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
A234H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A234I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A234K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A234L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A234M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A234N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A234P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A234Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A234R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
A234S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T235Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
H236A	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H236C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H236D	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H236E	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H236F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H236G	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H236I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H236K	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H236L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H236M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H236N	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H236P	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H236Q	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H236R	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H236S	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H236T	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H236V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H236W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H236Y	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
A237C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
A237D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A237E	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious
A237F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A237G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A237H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A237I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A237K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
A237L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A237M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A237N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A237P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A237Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A237R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
A237S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A237T	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A237V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A237W	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A237Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
P238A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P238C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P238D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P238E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P238F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P238G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P238H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V239M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
V239N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V239P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
V239Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V239R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V239S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V239T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
V239W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V239Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y240A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y240C	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y240D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
Y240E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y240F	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Y240G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y240H	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y240I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y240K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y240L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
Y240M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y240N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y240P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y240Q	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y240R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y240S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y240T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y240V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y240W	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A241C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A241D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A241E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A241F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A241G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A241H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A241I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A241K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A241L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A241M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A241N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A241P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral
A241Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A241R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A241S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A241T	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A241V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
A241W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A241Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
S242A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
S242C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S242D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S242E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S242F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
S242G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S242H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S242I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S242K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S242L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S242M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
S242N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
S242P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
S242Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S242R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S242T	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S242V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S242W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S242Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
K243A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
K243C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
K243D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
K243E	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
K243F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
K243G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
K243H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
K243I	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
K243L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
K243M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
K243N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
K243P	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K243Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K243R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K243S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K243T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
K243V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K243W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K243Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P244A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
P244C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P244D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P244E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P244F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P244G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
P244H	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
P244I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P244K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P244L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
P244M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
P244N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P244Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P244R	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P244S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P244T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P244V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
P244W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P244Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F245A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F245C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F245D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F245E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F245G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F245H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
F245I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F245K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F245L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F245M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F245N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F245P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F245Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F245R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
F245S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
F245T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F245V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F245W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F245Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L246A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L246C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L246D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
L246E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L246F	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L246G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L246H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L246I	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L246K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L246M	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L246N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G247S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G247T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G247V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G247W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G247Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T248A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
T248C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T248D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T248E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
T248F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T248G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
T248H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T248I	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
T248K	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T248L	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
T248M	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T248N	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T248P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T248Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
T248R	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
T248S	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T248V	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T248W	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T248Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
S249A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S249C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S249D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S249E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S249F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S249G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S249H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S249I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S249K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S249L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S249M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S249N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S249P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S249Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S249R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
S249T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S249V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S249W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S249Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q250A	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q250C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Q250D	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
Q250E	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Q250F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q250G	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Q250H	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q250I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q250K	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q250L	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Q250M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q250N	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q250P	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q250R	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q250S	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q250T	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Q250V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
Q250W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Q250Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
R251A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
R251C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
R251D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R251E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R251F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
R251G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R251H	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
R251I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R251K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
R251L	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
R251M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
R251N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
R251P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
R251Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R251S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
R251T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
R251V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R251W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R251Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G252A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G252C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G252D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G252E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G252F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G252H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G252I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G252K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G252L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G252M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G252N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G252P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
G252Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G252R	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G252S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G252T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G252V	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G252W	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G252Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R253A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
R253C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
R253D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R253E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
R253F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
R253G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
R253H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
R253I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
R253K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R253L	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R253M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
R253N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
R253P	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
R253Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
R253S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
R253T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
R253V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
R253W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
R253Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
Y254A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y254C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y254D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y254E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y254F	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y254G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y254H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Y254I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y254K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y254L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y254M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y254N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y254P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y254Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y254R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y254S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y254T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y254V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y254W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G255A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G255C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G255D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G255E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G255F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G255H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G255I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G255K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G255L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G255M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G255N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G255P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G255Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G255R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G255S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G255T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A257C	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A257D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A257E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A257F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A257G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A257H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A257I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
A257K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A257L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A257M	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A257N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A257P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A257Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A257R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A257S	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A257T	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A257V	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A257W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A257Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V258A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V258C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V258D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V258E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V258F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V258G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V258H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V258I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
V258K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V258L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V258M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
V258N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V258P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V258Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V258R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V258S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V258T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V258W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
V258Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R259A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
R259C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R259D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
R259E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
R259F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
R259G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R259H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
R259I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious
R259K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
R259L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
R259M	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
R259N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
R259P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
R259Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
R259S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
R259T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
R259V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious
R259W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R259Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E260A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E260C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E260D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E260F	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E260G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E260H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I261M	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
I261N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I261P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I261Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I261R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I261S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I261T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I261V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
I261W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
I261Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D262A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D262C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D262E	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D262F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D262G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D262H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D262I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D262K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D262L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D262M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D262N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D262P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S264Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
I265A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
I265C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I265D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I265E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I265F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I265G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I265H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I265K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I265L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
I265M	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
I265N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I265P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I265Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I265R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I265S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I265T	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I265V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
I265W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
I265Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G266A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G266C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G266D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G266E	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G266F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G266H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G266I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G266K	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G266L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G266M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G266N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G266P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G266Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G266R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G266S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G266T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G266V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G266W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G266Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
K267A	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
K267C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
K267D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K267E	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
K267F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
K267G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K267H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
K267I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K267L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
K267M	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
K267N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
K267P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
K267Q	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K267R	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K267S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K267T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
K267V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
K267W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K267Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I268A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I268C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I268D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I268E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I268F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I268G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I268H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I268K	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I268L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I268M	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
I268N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I268P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I268Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I268R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I268S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I268T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I268V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
I268W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
I268Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L269A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L269C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L269D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L269E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L269F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L269G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L269H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L269I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L269K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L269M	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L269N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E270S	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E270T	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
E270V	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
E270W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E270Y	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
L271A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L271C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L271D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L271E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L271F	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L271G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L271H	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
L271I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L271K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
L271M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L271N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L271P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L271Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L271R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
L271S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
L271T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
L271V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L271W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
L271Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
L272A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272I	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L272K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L272N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L272T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L272V	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L272W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L272Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q273A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q273C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q273D	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q273E	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Q273F	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q273G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Q273H	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q273I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Q273K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q273L	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
Q273M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q273N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q273P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q273R	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q273S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q273T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q273V	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
Q273W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q273Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
D274A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
D274C	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
D274E	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
D274F	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
D274G	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
D274H	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
D274I	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
D274K	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
D274L	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
D274M	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D274N	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
D274P	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
D274Q	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
D274R	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
D274S	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
D274T	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
D274V	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
D274W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
D274Y	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
L275A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L275C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L275D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L275E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L275F	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L275G	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
L275H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L275I	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L275K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L275M	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L275N	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L275P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L275Q	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L275R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L275S	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L275T	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L275V	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L275W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
L275Y	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
H276A	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
H276C	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
H276D	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
H276E	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
H276F	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
H276G	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
H276I	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
H276K	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
H276L	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
H276M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H276N	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
H276P	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
H276Q	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
H276R	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
H276S	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
H276T	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
H276V	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
H276W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
H276Y	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
V277A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
V277C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
V277D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V277E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V277F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V277G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V277H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V277I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
V277K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V277L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
V277M	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
V277N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V277P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V277Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V277R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V277S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V277T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V277W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V277Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
A278C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A278D	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A278E	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
A278F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A278G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A278H	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A278I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
A278K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A278L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
A278M	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
A278N	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A278P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A278Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A278R	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A278S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A278T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A278V	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
A278W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A278Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D279A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
D279C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D279E	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
D279F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D279G	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
D279H	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
D279I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
D279K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
D279L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
D279M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D279N	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
D279P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
D279Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious
D279R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
D279S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
D279T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious
D279V	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
D279W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D279Y	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N280A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N280C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N280D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
N280E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N280F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N280G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N280H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
N280I	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N280K	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N280L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N280M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N280P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N280Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N280R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N280S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
N280T	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N280V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N280W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N280Y	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T281A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T281C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T281D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F282I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
F282K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F282L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
F282M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
F282N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F282P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F282Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F282R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F282S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F282T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F282V	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
F282W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F282Y	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
V283A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V283I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
V283K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V283L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V283W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
V283Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F284A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F284C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F284D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F284E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
F284G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F284H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F284I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
F284K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F284L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious
F284M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F284N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F284P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F284Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F284R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F284S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F284T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F284V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
F284W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F284Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
F285A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F285C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F285D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F285E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F285G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F285H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F285I	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F285K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F285L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F285M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F285N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F285P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F285Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F285R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F285S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T286Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
S287A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S287C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S287D	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S287E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S287F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S287G	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S287H	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S287I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S287K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S287L	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S287M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S287N	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S287P	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S287Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S287R	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
S287T	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S287V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S287W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S287Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D288A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D288C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N289G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N289H	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N289I	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N289K	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N289L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N289M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N289P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N289Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N289R	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N289S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N289T	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N289V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N289W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N289Y	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G290A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G290C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G290D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G290E	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G290F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G290H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G290I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G290K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G290L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G290M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G290N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G290P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G290Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G290R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G290S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G290T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G290V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G290W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G290Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A291C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A291D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A291E	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A291F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A291G	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A291H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A291I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A291K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A291L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A291M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A291N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A291P	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A291Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A291R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A291S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A291T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
A291V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A291W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A291Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A292C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A292D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A292E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A292F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A292G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A292H	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A292I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
A292K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
A292L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A292M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A292N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A292P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A292Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A292R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A292S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A292T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A292V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A292W	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A292Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L293A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L293C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L293D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L293E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L293F	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L293G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L293H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L293I	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L293K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L293M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L293N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L293P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L293Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
L293R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L293S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
L293T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L293V	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L293W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
L293Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I294A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I294C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I294D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I294E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I294F	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I294G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I294H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I294K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I294L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I294M	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I294N	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
I294P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
I294Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I294R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I294S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
I294T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
I294V	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
I294W	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
I294Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
S295A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S295C	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
S295D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S295E	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
S295F	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S295G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
S295H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
S295I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S295K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S295L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
S295M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S295N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
S295P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
S295Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S295R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S295T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S295V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
S295W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
S295Y	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A296C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A296D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A296E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A296F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A296G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A296H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A296I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A296K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A296L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A296M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A296N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A296P	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A296Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A296R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A296S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A296T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A296V	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A296W	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A296Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
P297A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
P297C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
P297D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
P297E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
P297F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P297G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
P297H	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E298N	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E298P	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E298Q	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E298R	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E298S	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E298T	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
E298V	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
E298W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
E298Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q299A	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q299C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q299D	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q299E	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q299F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q299G	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
Q299H	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q299I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q299K	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q299L	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q299M	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q299N	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q299P	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q299R	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q299S	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q299T	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Q299V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Q299W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q299Y	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
G300A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
G300C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
G300D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G300E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G300F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G300H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G300I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G300K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G300L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G300M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G300N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G300P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G300Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G300R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G300S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
G300T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G300V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
G300W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G300Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G301A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G301C	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G301D	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G301E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G301F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G301H	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G301I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G301K	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G301L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G301M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G301N	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G301P	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G301Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G301R	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G301S	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G301T	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G301V	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G301W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G301Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S302A	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
S302C	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S302D	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S302E	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S302F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S302G	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
S302H	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
S302I	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S302K	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S302L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S302M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S302N	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
S302P	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S302Q	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S302R	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S302T	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
S302V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S302W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
S302Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N303A	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
N303C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N303D	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G304I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G304K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G304L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G304M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G304N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G304P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G304Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G304R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G304S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G304T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G304V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G304W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G304Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P305A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P305C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P305D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P305E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P305F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P305G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P305H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P305I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P305K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P305L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P305M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P305N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P305Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P305R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P305S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P305T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P305V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P305W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P305Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F306A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F306C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F306D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F306E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F306G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F306H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F306I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
F306K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F306L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
F306M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
F306N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F306P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F306Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F306R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F306S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F306T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F306V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F306W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
F306Y	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
L307A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L307C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L307D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L307E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
L307F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L307G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L307H	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
L307I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L307K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L307M	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L307N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L307P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L307Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
L307R	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L307S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L307T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
L307V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L307W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L307Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
C308A	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308D	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308E	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308G	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
C308H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
C308S	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C308T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
C308V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C308W	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
C308Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G309A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G309E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G309T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G309V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G309W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G309Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K310A	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
K310C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310D	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K310E	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310H	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K310M	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310N	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310P	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310Q	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310R	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310S	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310T	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K310V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K310Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q311A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
Q311C	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q311D	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q311E	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Q311F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q311G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q311H	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral
Q311I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q311K	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
Q311L	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q311M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q311N	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
Q311P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
Q311R	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q311S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
Q311T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
Q311V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q311W	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q311Y	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T312A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T312C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T312D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T312E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T312F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T312G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T312H	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T312I	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T312K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T312L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T312M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T312N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T312P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T312Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T312R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T312S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
T312V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T312W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T312Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T313A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T313C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T313D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T313E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T313F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T313G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T313H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T313I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T313K	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T313L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T313M	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T313N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T313P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T313Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T313R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T313S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T313V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T313W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T313Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F314A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
F314M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F314N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F314P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F314V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
F314W	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
F314Y	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
E315A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
E315C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E315D	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral
E315F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E315G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E315H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E315I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E315K	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E315L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E315M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E315N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E315P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E315Q	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E315R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G316W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G316Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G317A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G317C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G317D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G317E	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G317F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G317H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G317I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G317K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G317L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G317M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G317N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G317P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G317Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G317R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G317S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G317T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G317V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G317W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G317Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M318A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
M318C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M318D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M318E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M318F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
M318G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M318H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M318I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
M318K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M318L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
M318N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
M318P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M318Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M318R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M318S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
M318T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M318V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
M318W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M318Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R319A	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R319F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319K	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319M	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R319P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R319V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R319Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E320A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E320C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E320D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
E320F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E320G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E320H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E320I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E320K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E320L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E320M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E320N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E320P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E320Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
E320R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E320S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E320T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
E320V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
E320W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E320Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321E	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321H	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321K	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P321L	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P321M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321R	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P321W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P321Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
A322C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral
A322D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A322E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A322F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
A322G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
A322H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A322I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A322K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A322L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
A322M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A322N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A322P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
A322Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A322R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
A322S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A322T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
A322V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A322W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
A322Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L323A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
L323C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L323D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L323E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L323F	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L323G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L323H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L323I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L323K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L323M	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L323N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L323P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L323Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L323R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L323S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
L323T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
W326C	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
W326D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W326E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W326F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
W326G	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
W326H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W326I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W326K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W326L	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W326M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W326N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
W326P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
W326Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W326R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
W326S	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W326T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
W326V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
W326Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P327A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P327F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P327N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P327Q	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P327W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P327Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G328A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G328C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G328D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G328E	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G328F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G328H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G328I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G328K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
G328L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G328M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G328N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G328P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G328Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G328R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
G328S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G328T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G328V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G328W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G328Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H329A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H329C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H329D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H329E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H329F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
H329G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H329I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H329K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H329L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H329M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H329N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H329P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H329Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
H329R	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
H329S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H329T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
H329V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H329W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H329Y	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V330A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V330C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V330D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V330E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V330F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V330G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V330H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
V330I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
V330K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
V330L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
V330M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
V330N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V330P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T331V	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
T331W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
T331Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
A332C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
A332D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A332E	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
A332F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A332G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
A332H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
A332I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
A332K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
A332L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A332M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
A332N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A332P	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
A332Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
A332R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
A332S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A332T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A332V	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
A332W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A332Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G333A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G333C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G333D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G333E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G333F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G333H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G333I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G333K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G333L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G333M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G333N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G333P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G333Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G333R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G333S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G333T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G333V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G333W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G333Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Q334A	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q334C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q334D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q334E	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q334F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q334G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
Q334H	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
Q334I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q334K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q334L	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Q334M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
Q334N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q334P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q334R	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q334S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q334T	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q334V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
Q334W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q334Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V335A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V335C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V335D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V335E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V335F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V335G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V335H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V335I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
V335K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V335L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V335M	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V335N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V335P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V335Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V335R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V335S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V335T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V335W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
V335Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
S336A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S336C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S336D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S336E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S336F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S336G	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S336H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S336I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
S336K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S336L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
S336M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S336N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
S336P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
S336Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
S336R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
S336T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
S336V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
S336W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
S336Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H337A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H337C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
H337D	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H337E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H337F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
H337G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
H337I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H337K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H337L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H337M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H337N	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
H337P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H337Q	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H337R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
H337S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H337T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H337V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H337W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H337Y	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
Q338A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q338C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q338D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q338E	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Q338F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q338G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Q338H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
Q338I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q338K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
Q338L	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q338M	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
Q338N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
Q338P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q338R	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
Q338S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L339Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G340A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
G340C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G340D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G340E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G340F	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G340H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G340I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G340K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G340L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G340M	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G340N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G340P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G340Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G340R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
G340S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious
G340T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G340V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G340W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G340Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
S341A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
S341C	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S341D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S341E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S341F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S341G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
S341H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S341I	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S341K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S341L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S341M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S341N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious
S341P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S341Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S341R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
S341T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
S341V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
S341W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S341Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
I342A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I342C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I342D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I342E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I342F	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I342G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I342H	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I342K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
I342L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I342M	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I342N	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
I342P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
I342Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
I342R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I342S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I342T	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I342V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
I342W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
I342Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
M343A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M343C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M343D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M343E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M343F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
D344H	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D344I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D344K	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D344L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D344M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D344N	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D344P	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D344Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D344R	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D344S	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D344T	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D344V	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D344W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D344Y	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L345A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L345C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L345D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L345E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L345F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L345G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L345H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L345I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L345K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L345M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L345N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L345P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L345Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L345R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L345S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L345T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L345V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L345W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L345Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F346A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F346I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F346L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F346M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F346P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F346W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F346Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
T347A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
T347C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T347D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T347E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T347F	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T347G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T347H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T347I	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T347K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T347L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
T347M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T347N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T348S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T348V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T348W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T348Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
S349A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S349C	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
S349D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S349E	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S349F	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
S349G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S349H	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
S349I	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
S349K	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
S349L	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S349M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
S349N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S349P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
S349Q	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S349R	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
S349T	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S349V	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S349W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A351E	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
A351F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A351G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A351H	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
A351I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A351K	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A351L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A351M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A351N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
A351P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A351Q	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A351R	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A351S	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A351T	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A351V	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious
A351W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A351Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L352A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L352C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L352D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L352E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L352F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L352G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L352H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L352I	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L352K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L352M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
L352N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L352P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L352Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L352R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L352S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L352T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L352V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L352W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
L352Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A353C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A353D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A353E	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A353F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
A353G	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A353H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
A353I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A353K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G354P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G354Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G354R	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G354S	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G354T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G354V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G354W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G354Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
L355A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L355C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L355D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L355E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L355F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L355G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L355H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L355I	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L355K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L355M	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L355N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L355P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L355Q	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L355R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L355S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L355T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L355V	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L355W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
L355Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
T356A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
T356C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T356D	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T356E	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
T356F	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T356G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T356H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T356I	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T356K	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T356L	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
T356M	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T356N	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T356P	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T356Q	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T356R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T356S	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T356V	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T356W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T356Y	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
P357A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
P357C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
P357D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P357E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
P357F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
P357G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P357H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P357I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
P357K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
P357L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
P357M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
P357N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P357Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
P357R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P357S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
P357T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
P357V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
P357W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P357Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
P358A	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P358C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P358D	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P358E	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P358F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P358G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P358H	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P358I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P358K	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P358L	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P358M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P358N	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P358Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P358R	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P358S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P358T	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P358V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P358W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P358Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
S359A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
S359C	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
S359D	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S359E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
D360K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
D360L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
D360M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
D360N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
D360P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
D360Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
D360R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
D360S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
D360T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
D360V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
D360W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D360Y	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R361A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R361C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R361D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R361E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R361F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R361G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
R361H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
R361I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
R361K	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
R361L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A362R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A362S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A362T	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A362V	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A362W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
A362Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
I363A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I363C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I363D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I363E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I363F	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
I363G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I363H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I363K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I363L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
I363M	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
I363N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I363P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I363Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I363R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I363S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I363T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G365A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G365C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G365D	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G365E	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G365F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G365H	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G365I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G365K	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G365L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G365M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G365N	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G365P	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G365Q	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G365R	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G365S	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G365T	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G365V	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G365W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G365Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
L366A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L366C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L366D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L366E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L366F	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L366G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L366H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L366I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L366K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L366M	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L366N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
L366P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L366Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
L366R	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L366S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L366T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L366V	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L366W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
L366Y	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
N367A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious
N367C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N367D	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
N367E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
N367F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N367G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N367H	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
N367I	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
N367K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
N367L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
N367M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N367P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
N367Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
N367R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N367S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
N367T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
N367V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
N367W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N367Y	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L368A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L368C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L368D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L368E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L368F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L368G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L368H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L368I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L368K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L368M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
L368N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L368P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L368Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L368R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L368S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L368T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L368V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L368W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L368Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
L369A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
L369C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L369D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L369E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L369F	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L369G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
L369H	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L369I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
L369K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L369M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L369N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L369P	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L369Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L369R	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
L369S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L369T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L369V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L369W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L369Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
P370A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P370C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P370D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P370E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P370F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P370G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P370H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P370I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P370K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P370L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P370M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P370N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P370Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P370R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P370S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P370T	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P370V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P370W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P370Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T371A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T371C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T371D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T371E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T371F	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T371G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
T371H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T371I	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T371K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T371L	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T371M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T371N	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T371P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T371Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T371R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T371S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T371V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T371W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T371Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L372A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
L372C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L372D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L372E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L372F	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
L372G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L372H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L372I	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L372K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L372M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L372N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L372P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L372Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L372R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L372S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L372T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L372V	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L372W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L372Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
L373A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L373C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L373D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L373E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L373F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L373G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L373H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L373I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L373K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
L373M	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L373N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L373P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L373Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L373R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L373S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L373T	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L373V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L373W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
L373Y	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
Q374A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Q374C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q374D	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q374E	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
Q374F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q374G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q374H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q374I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q374K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q374L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Q374M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q374N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q374P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q374R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q374S	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q374T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q374V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
Q374W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q374Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G375A	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
G375C	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
G375D	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
G375E	N/A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G375F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G375H	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G375I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G375K	N/A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G375L	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G375M	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G375N	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
G375P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G375Q	N/A	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G375R	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
G375S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
G375T	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G375V	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G375W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G375Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R376A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
R376C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R376D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
R376E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
R376F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R376G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R376H	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
R376I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious
R376K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
R376L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
R376M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L377S	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L377T	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L377V	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L377W	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
L377Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
M378A	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
M378C	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
M378D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
M378E	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
M378F	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
M378G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
M378H	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
M378I	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
M378K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
M378L	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
M378N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
M378P	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
M378Q	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
M378R	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
M378S	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
M378T	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
M378V	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
M378W	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
M378Y	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
D379A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
D379C	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
D379E	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
D379F	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
D379G	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
D379H	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D379I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D379K	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D379L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
D379M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
D379N	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
D379P	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D379Q	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D379R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D379S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
D379T	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
D379V	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
D379W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D379Y	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
R380A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R380C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R380D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R380E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
R380F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R380G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious
R380H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
R380I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R380K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
R380L	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R380M	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R380N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
R380P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious
R380Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
R380S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
R380T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
R380V	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R380W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R380Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P381A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P381C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P381D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P381E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
P381F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P381G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P381H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P381I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P381K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
P381L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P381M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P381N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P381Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
P381R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P381S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
P381T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
P381V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P381W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P381Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I382A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
I382C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
I382D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
I382E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I382F	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I382G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I382H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
I382K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
I382L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
I382M	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
I382N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
I382P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I382Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
I382R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I382S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
I382T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I382V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
I382W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
I382Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
F383A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F383C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F383D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F383E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F383G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F383H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F383I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F383K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
F383L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
F383M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F383N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F383P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
F383Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F383R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F383S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F383T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
F383V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F383W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
F383Y	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
Y384A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y384C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y384D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y384E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Y384F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
Y384G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y384H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
Y384I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y384K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y384L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y384M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Y384N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y384P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
Y384Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y384R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y384S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y384T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y384V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y384W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y385A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y385C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y385D	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y385E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Y385F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Y385G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y385H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y385I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Y385K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y385L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Y385M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Y385N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Y385P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Y385Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y385R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Y385S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Y385T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Y385V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Y385W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
R386A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
R386C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R386D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R386E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R386F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R386G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R386H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
R386I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R386K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
R386L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R386M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R386N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R386P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
R386Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
R386S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
R386T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T389E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T389F	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
T389G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
T389H	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T389I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T389K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T389L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T389M	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
T389N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T389P	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T389Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
T389R	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
T389S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T389V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T389W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
T389Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
L390A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
L390C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L390D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L390E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L390F	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L390G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L390H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L390I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L390K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L390M	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L390N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L390P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L390Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L390R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L390S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L390T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious
L390V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L390W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L390Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
M391A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M391C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M391D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M391E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M391F	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
M391G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
M391H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
M391I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
M391K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A392Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A392R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A392S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A392T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A392V	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A392W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A392Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A393C	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
A393D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
A393E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
A393F	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
A393G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
A393H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A393I	N/A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A393K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
A393L	N/A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A393M	N/A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A393N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A393P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A393Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
A393R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A393S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A393T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
A393V	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A393W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
A393Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
T394A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
T394C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
T394D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
T394E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
T394F	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
T394G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
T394H	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
T394I	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
T394K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
T394L	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
T394M	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
T394N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
T394P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
T394Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
T394R	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
T394S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
T394V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
T394W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q397G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q397H	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
Q397I	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
Q397K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q397L	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q397M	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q397N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q397P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
Q397R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q397S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q397T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q397V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q397W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Q397Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
H398A	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
H398C	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H398D	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
H398E	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
H398F	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
H398G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H398I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H398K	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A400S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
A400T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A400V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A400W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A400Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H401A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
H401C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H401D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H401E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H401F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H401G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H401I	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H401K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H401L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H401M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H401N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H401P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H401Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H401R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H401S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H401T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H401V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H401W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H401Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
F402A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
F402C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F402D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F402E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F402G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F402H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F402I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
F402K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F402L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
F402M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F402N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F402P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F402Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F402R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F402S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
F402T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F402V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
F402W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F402Y	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
W403A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
W403C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403F	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403L	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403M	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403P	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious
W403S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious
W403V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W403Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
T404A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T404C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T404D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T404E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T404F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T404G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious
T404H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T404I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T404K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T404L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T404M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T404N	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T404P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T404Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T404R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T404S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T404V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
T404W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T404Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
W405A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W405C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W405D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W405E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W405F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
W405G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W405H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
W405I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W405K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
W405L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W405M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W405N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
W405P	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W405Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
W405R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
W405S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral
W405T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
W405V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W405Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T406A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T406C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T406D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T406E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T406F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T406G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
T406H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T406I	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T406K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T406L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T406M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T406N	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T406P	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T406Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T406R	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
T406S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T406V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T406W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T406Y	N/A	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N407A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N407C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N407D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
N407E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N407F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N407G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
N407H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
N407I	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N407K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N407L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N407M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
N407P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N407Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N407R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N407S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
N407T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
N407V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N407W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N407Y	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S408A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S408C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S408D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S408E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S408F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S408G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
S408H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
S408I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S408K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S408L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S408M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S408N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S408P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S408Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S408R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
S408T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S408V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S408W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
S408Y	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
W409A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
W409C	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W409D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
W409E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
W409F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
W409G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
W409H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
W409I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
W409K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
W409L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
W409M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
W409N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
W409P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious
W409Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
W409R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
W409S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
W409T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
W409V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
W409Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F412I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
F412K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
F412L	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
F412M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
F412N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
F412P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
F412Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
F412R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
F412S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
F412T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
F412V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
F412W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
F412Y	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R413A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R413C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
R413D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R413E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R413F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
R413G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R413H	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
R413I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
R413K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R413L	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
R413M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
R413N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R413P	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
R413Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R413S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
R413T	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R413V	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious
R413W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
R413Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
Q414A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q414C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q414D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q414E	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q414F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q414G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q414H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q414I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q414K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q414L	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q414M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q414N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q414P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q414R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q414S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q414T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q414V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q414W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
Q414Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
G415A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G415C	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G415D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G415E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G415F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G415H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G415I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G415K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G415L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G415M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G415N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G415P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G415Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G415R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G415S	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G415T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
G415V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G415W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G415Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
I416A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I416C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I416D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I416E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I416F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I416G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I416H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I416K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I416L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I416M	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I416N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
I416P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I416Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I416R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
I416S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I416T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I416V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
I416W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
I416Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
D417A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D417C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D417E	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D417F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D417G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D417H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
D417I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D417K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D417L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D417M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
D417N	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
D417P	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D417Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D417R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D417S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D417T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
D417V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
D417W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D417Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
F418A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
F418C	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F418D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F418E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
F418G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
F418H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
F418I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
F418K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
F418L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
F418M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
F418N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
F418P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F418Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F418R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
F418S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
F418T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
F418V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
F418W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F418Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
C419A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C419D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C419E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C419F	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C419G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
C419H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C419I	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C419K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
C419L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C419M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C419N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
C419P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
C419Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C419R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
C419S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C419T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
C419V	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C419W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
C419Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P420A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P420C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P420D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P420E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P420F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P420G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P420H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P420I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P420K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
P420L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P420M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P420N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P420Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P420R	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P420S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P420T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P420V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P420W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P420Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G421A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G421C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
G421D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G421E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G421F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G421H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G421I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
G421K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
G421L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G421M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G421N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G421P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G421Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G421R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G421S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G421T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G421V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G421W	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G421Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Q422A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q422C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q422D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q422E	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q422F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q422G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q422H	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q422I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q422K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q422L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q422M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
Q422N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q422P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q422R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q422S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q422T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q422V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q422W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Q422Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
N423A	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
N423C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N423D	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
N423E	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N423F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N423G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
N423H	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
N423I	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N423K	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
N423L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N423M	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
N423P	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
N423Q	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
N423R	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
N423S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
N423T	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
N423V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N423W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N423Y	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
V424A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
V424C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V424D	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V424E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V424F	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V424G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V424H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V424I	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V424K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V424L	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V424M	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
V424N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V424P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
V424Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V424R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V424S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V424T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V424W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V424Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S425A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S425C	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
S425D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
S425E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S425F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S425G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S425H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S425I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S425K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S425L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S425M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S425N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
S425P	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
S425Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S425R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S425T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S425V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S425W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
S425Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
G426A	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
G426C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G426D	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G426E	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
G426F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G426H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G426I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G426K	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G426L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G426M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G426N	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
G426P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G426Q	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G426R	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G426S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
G426T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G426V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G426W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G426Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V427A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
V427C	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
V427D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V427E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V427F	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V427G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
V427H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V427I	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
V427K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V427L	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
V427M	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
V427N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
V427P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V427Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
V427R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V427S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V427T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
V427W	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
V427Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T428A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T428C	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T428D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T428E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T428F	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T428G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T428H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T428I	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T428K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T428L	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T428M	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
T428N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T428P	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T428Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T428R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T428S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T428V	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
T428W	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
T428Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T429A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T429C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T429D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T429E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T429F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T429G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T429H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T429I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T429K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T429L	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T429M	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
T429N	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T429P	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T429Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T429R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T429S	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T429V	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
T429W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
T429Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
H430A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H430C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H430D	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H430E	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H430F	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H430G	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H430I	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H430K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H430L	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H430M	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H430N	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H430P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
H430Q	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H430R	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H430S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H430T	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H430V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
H430W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
H430Y	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N431A	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N431C	N/A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
N431D	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
N431E	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N431F	N/A	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
N431G	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N431H	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N431I	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N431K	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
N431L	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N431M	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N431P	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
N431Q	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N431R	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N431S	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N431T	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
N431V	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N431W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
N431Y	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L432A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
L432C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L432D	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L432E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L432F	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L432G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L432H	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L432I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L432K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L432M	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L432N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L432P	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L432Q	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L432R	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L432S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
L432T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L432V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L432W	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L432Y	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
E433A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
E433C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
E433D	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E433F	N/A	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
E433G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
E433H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
E433I	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
E433K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
E433L	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
E433M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
E433N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
E433P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
E433Q	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E433R	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
E433S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
E433T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
E433V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E433W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
E433Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
D434A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D434C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
D434E	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
D434F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
D434G	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D434H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
D434I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D434K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D434L	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
D434M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
D434N	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
D434P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D434Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D434R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D434S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
D434T	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
D434V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
D434W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
D434Y	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
H435A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H435C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H435D	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H435E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H435F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H435G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H435I	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H435K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H435L	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H435M	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H435N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H435P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H435Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H435R	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H435S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H435T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H435V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H435W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H435Y	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
T436A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T436C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T436D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T436E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T436F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T436G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T436H	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
T436I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T436K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T436L	N/A	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T436M	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
T436N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T436P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
T436Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T436R	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T436S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
T436V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T436W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
T436Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
K437A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K437C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
K437D	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K437E	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K437F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
K437G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K437H	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
K437I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K437L	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K437M	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K437N	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K437P	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K437Q	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K437R	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K437S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
K437T	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K437V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K437W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
K437Y	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
L438A	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
L438C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
L438D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
L438E	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L438F	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
L438G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L438H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L438I	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L438K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L438M	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L438N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
L438P	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L438Q	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L438R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L438S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
L438T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L438V	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L438W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L440D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L440E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L440F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L440G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L440H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L440I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L440K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L440M	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
L440N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
L440P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L440Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L440R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L440S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
L440T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L440V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
L440W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L440Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
I441A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I441C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I441D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
I441E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I441F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F442L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F442M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F442N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F442P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F442Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F442R	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F442S	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F442T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F442V	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F442W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F442Y	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
H443A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H443C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H443D	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H443E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
H443F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H443G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H443I	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H443K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
H443L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H443M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H443N	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H443P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
H443Q	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
H443R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H443S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H443T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H443V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H443W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H443Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L444A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L444C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L444D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L444E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L444F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L444G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L444H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L444I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L444K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L444M	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
L444N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L444P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L444Q	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L444R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L444S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L444T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L444V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L444W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L444Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G445A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G445C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G445D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G445E	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G445F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
G445H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G445I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G445K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G445L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G445M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
G445N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
G445P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G445Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G445R	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G445S	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G445T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
G445V	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R451Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
R451S	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
R451T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
R451V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R451W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
R451Y	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F452A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
F452C	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
F452D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F452E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F452G	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F452H	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
F452I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
F452K	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
F452L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
F452M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
F452N	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
F452P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
F452Q	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
F452R	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F452S	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
F452T	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
F452V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious
F452W	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
F452Y	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
P453A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P453C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P453D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
P453E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
P453F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P453G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P453H	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P453I	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P453K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P453L	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P453M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P453N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
P453Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P453R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P453S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
P453T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
P453V	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P453W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P453Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L454A	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L454C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L454D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L454E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L454F	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
L454G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L454H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L454I	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L454K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L454M	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L454N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L454P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L454Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L454R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L454S	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L454T	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L454V	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L454W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L454Y	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S455A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S455C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
S455D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A457M	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A457N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A457P	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A457Q	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A457R	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A457S	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A457T	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A457V	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A457W	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A457Y	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
S458A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S458C	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S458D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
S458E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
S458F	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
S458G	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S458H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S458I	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
S458K	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
S458L	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
S458M	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
S458N	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S458P	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S458Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S458R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
S458T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S458V	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S458W	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S458Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A459C	N/A	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
A459D	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A459E	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A459F	N/A	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A459G	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A459H	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A459I	N/A	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious
A459K	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A459L	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
A459M	N/A	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
A459N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A459P	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A459Q	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A459R	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A459S	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q462D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q462E	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q462F	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q462G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
Q462H	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q462I	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
Q462K	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q462L	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q462M	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q462N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q462P	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
Q462R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q462S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q462T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q462V	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q462W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Q462Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E463A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
E463C	N/A	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E463D	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
E463F	N/A	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E463G	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E463H	N/A	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E463I	N/A	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral
E463K	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
E463L	N/A	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
E463M	N/A	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E463N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E463P	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious
E463Q	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E463R	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
E463S	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
E463T	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
E463V	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
E463W	N/A	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
E463Y	N/A	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
A464C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A464D	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A464E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
A464F	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A464G	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A464H	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
A464I	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
A464K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L465P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L465Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L465R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious
L465S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L465T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L465V	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
L465W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L465Y	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
S466A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S466C	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
S466D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S466E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S466F	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S466G	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S466H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S466I	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S466K	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S466L	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S466M	N/A	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S466N	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S466P	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S466Q	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S466R	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
S466T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S466V	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S466W	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
S466Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
R467A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R467C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
R467D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R467E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R467F	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
R467G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
R467H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R467I	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral
R467K	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R467L	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
R467M	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
R467N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R467P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious
R467Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R467S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
R467T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
R467V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
R467W	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral
R467Y	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I468A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
I468C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I468D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
I468E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I468F	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I468G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I468H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I468K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
I468L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I468M	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
I468N	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
I468P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
I468Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
I468R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
I468S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
I468T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
I468V	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
I468W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
I468Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
T469A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S470F	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious
S470G	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S470H	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
S470I	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S470K	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S470L	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S470M	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
S470N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S470P	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S470Q	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
S470R	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
S470T	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S470V	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S470W	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
S470Y	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious
V471A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V471C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V471D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V471E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
V471F	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V471G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V471H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V471I	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V471K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
V471L	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V471M	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
V471N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V471P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V471Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V471R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V471S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V471T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
V471W	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V471Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V472A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V472C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V472D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V472E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
V472F	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
V472G	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
V472H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
V472I	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V472K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
V472L	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V472M	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
V472N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V472P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
V472Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V472R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
V472S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V472T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
V472W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V472Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q473A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q473C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Q473D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q473E	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q473F	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Q473G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
Q473H	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
Q473I	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
Q473K	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q473L	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Q473M	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Q473N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q473P	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q473R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q473S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q473T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q473V	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
Q473W	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Q473Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Q474A	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q474C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Q474D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q474E	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q474F	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Q474G	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q474H	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
Q474I	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q474K	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Q474L	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q474M	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q474N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q474P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q474R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
Q474S	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q474T	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q474V	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q474W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Q474Y	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
H475A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H475C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H475D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H475E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
H475F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H475G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H475I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H475K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
H475L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H475M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H475N	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
H475P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H475Q	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H475R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
H475S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H475T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
H475V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
H475W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H475Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E477F	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E477G	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
E477H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
E477I	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
E477K	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E477L	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E477M	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E477N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E477P	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
E477Q	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E477R	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E477S	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E477T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
E477V	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E477W	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
E477Y	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A478C	N/A	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
A478D	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A478E	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A478F	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A478G	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A478H	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A478I	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A478K	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A478L	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A478M	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
A478N	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A478P	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A478Q	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A478R	N/A	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A478S	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A478T	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
A478V	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
A478W	N/A	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A478Y	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
L479A	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
L479C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L479D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L479E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L479F	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L479G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L479H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L479I	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L479K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L479M	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L479N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L479P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L479Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L479R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
L479S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
L479T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L479V	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L479W	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L479Y	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V480A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
V480C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V480D	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
V480E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
V480F	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V480G	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V480H	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
V480I	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V480K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
V480L	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V480M	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
V480N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V480P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral
V480Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V480R	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V480S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
V480T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
V480W	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V480Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P481A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
P481C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P481D	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P481E	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P481F	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P481G	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P481H	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P481I	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P481K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P481L	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P481M	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P481N	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P481Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P481R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P481S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A482Y	N/A	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral
Q483A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q483C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Q483D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q483E	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q483F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Q483G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q483H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q483I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
Q483K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q483L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral
Q483M	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q483N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q483P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q483R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
Q483S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q483T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
Q483V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral
Q483W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
Q483Y	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P484A	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P484C	N/A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
Q485G	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
Q485H	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Q485I	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q485K	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
Q485L	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q485M	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
Q485N	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q485P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q485R	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
Q485S	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Q485T	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
Q485V	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
Q485W	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
Q485Y	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L486A	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L486C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L486D	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L486E	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L486F	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L486G	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L486H	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L486I	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L486K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L486M	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L486N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L486P	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L486Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L486R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L486S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L486T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L486V	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L486W	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L486Y	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N487A	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N487C	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N487D	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N487E	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N487F	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N487G	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N487H	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N487I	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N487K	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N487L	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N487M	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
N487P	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N487Q	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
N487R	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
N487S	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
N487T	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
N487V	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N487W	N/A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N487Y	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
V488A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
V488C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
V488D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
V488E	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious
V488F	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
V488G	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious
V488H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
V488I	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V488K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious
V488L	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
V488M	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
V488N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
V488P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
V488Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V488R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
V488S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
V488T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious
V488W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
V488Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
C489A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
C489D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C489E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
C489F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
C489G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
C489H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
C489I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
C489K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
C489L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C489M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
C489N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C489P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C489Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
C489R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
C489S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
C489T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
C489V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
C489W	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C489Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
N490A	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
N490C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N490D	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
N490E	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
N490F	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N490G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious
N490H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
N490I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
N490K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
N490L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral
N490M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
N490P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
N490Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
N490R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
N490S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
N490T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
N490V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral
N490W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
N490Y	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
W491A	N/A	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
A492G	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A492H	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
A492I	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A492K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
A492L	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A492M	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
A492N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A492P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral
A492Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A492R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral
A492S	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
A492T	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A492V	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
A492W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
A492Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V493A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
V493C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V493D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V493E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral
V493F	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
V493G	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V493H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
V493I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V493K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V493L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
V493M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
V493N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V493P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
V493Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V493R	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
V493S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
V493T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
V493W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
V493Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
M494A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M494C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
M494D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M494E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M494F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
M494G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M494H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M494I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
M494K	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious
M494L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
M494N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M494P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
M494Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious
M494R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
M494S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M494T	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
M494V	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
M494W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
M494Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
N495A	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N495C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
N495D	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
N495E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N495F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
N495G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N495H	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
N495I	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
N495K	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral
N495L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N495M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
N495P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
N495Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P498A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P498D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498H	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498L	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P498R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P498T	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P498V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P498W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P498Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P499A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
P499C	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P499D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
E502Q	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
E502R	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
E502S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
E502T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
E502V	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
E502W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
E502Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
K503A	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious
K503C	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K503D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
K503E	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K503F	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K503G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K503H	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K503I	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K503L	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
K503M	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K503N	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K503P	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious
K503Q	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K503R	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K503S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
K503T	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
K503V	N/A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
K503W	N/A	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
K503Y	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L504A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
L504C	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
L504D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
L504E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L504F	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
L504G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L504H	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L504I	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
L504K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L504M	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L504N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
L504P	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L504Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L504R	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L504S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
L504T	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
L504V	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L504W	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
C507H	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C507I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C507K	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C507L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C507M	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C507N	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C507P	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C507Q	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C507R	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C507S	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
C507T	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
C507V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C507W	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
C507Y	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
L508A	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
L508C	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L508D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L508E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
L508F	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
L508G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L508H	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L508I	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
L508K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L508M	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L508N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L508P	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
L508Q	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
L508R	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious
L508S	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
L508T	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
L508V	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
L508W	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
L508Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
T509A	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
T509C	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
T509D	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
T509E	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
T509F	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
T509G	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
T509H	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
T509I	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral
T509K	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T509L	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T509M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
T509N	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
T509P	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
T509Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
T509R	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
T509S	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
T509V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
T509W	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral
T509Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
P510A	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
P510C	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral
P510D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
P510E	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
P510F	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
P510G	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious
P510H	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
P510I	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral
P510K	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
P510L	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral
P510M	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
P510N	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
P510Q	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious
P510R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P511W	N/A	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P511Y	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
E512A	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E512C	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
E512D	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E512F	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
E512G	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
E512H	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
E512I	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
E512K	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
E512L	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
E512M	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
E512N	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
E512P	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E512Q	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
E512R	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious
E512S	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
E512T	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Deleterious
E512V	Neutral	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious
E512W	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
E512Y	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious
S513A	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
P515I	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral
P515K	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral
P515L	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral
P515M	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
P515N	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P515Q	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P515R	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
P515S	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
P515T	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Neutral
P515V	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral
P515W	N/A	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious
P515Y	N/A	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral
K516A	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K516C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral
K516D	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K516E	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K516F	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K516G	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K516H	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K516I	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K516L	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K516M	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
K516N	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K516P	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral
K516Q	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K516R	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K516S	N/A	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K516T	Neutral	Neutral	Deleterious	Deleterious	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K516V	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K516W	N/A	Deleterious	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral
K516Y	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
K517A	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
K517C	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
K517D	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K517E	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
K517F	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
K517G	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K517H	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
K517I	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
K517L	N/A	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
K517M	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
K517N	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious
K517P	N/A	Deleterious	Deleterious	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Neutral
K517Q	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
S521E	N/A	Neutral	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
S521F	Neutral	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
S521G	N/A	Neutral	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S521H	N/A	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
S521I	N/A	Neutral	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
S521K	N/A	Neutral	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
S521L	N/A	Neutral	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S521M	N/A	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
S521N	N/A	Neutral	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
S521P	Neutral	Neutral	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S521Q	N/A	Neutral	N/A	Neutral	Neutral	Neutral	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Neutral
S521R	N/A	Neutral	N/A	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral
S521T	Neutral	Neutral	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
S521V	N/A	Neutral	N/A	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Deleterious	Neutral
S521W	N/A	Deleterious	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
S521Y	Neutral	Neutral	N/A	Neutral	Neutral	Deleterious	Neutral	Neutral	Deleterious	Neutral	Deleterious	Neutral
H522A	N/A	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522C	N/A	Deleterious	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Neutral
H522D	Deleterious	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522E	N/A	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522F	N/A	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522G	N/A	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious

Protein Mutation	Condel	FATHMM	MuStab	Mutation Assessor	MutPred v1.2	nsSNPAnalyzer	PANTHER	Pmut	Polyphen-2	PROVEAN	SIFT	SNAP
H522I	N/A	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522K	N/A	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522L	Deleterious	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522M	N/A	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522N	Deleterious	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522P	Deleterious	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H522Q	Deleterious	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522R	Deleterious	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Neutral
H522S	N/A	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522T	N/A	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522V	N/A	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Neutral	Deleterious	Deleterious	Deleterious	Deleterious
H522W	N/A	Deleterious	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Deleterious	Deleterious	Deleterious
H522Y	Deleterious	Neutral	N/A	Deleterious	Neutral	Deleterious	Neutral	Deleterious	Deleterious	Neutral	Deleterious	Deleterious