Table 1. Risk Loci and Pathway implicated for the Major Neurodegenerative Diseases.

Disease	Gene associated with risk/disease causing mutation	Pathways
AD	**APP**, **PSEN1**, **PSEN2**, *APOE, CR1, CLU, BIN1, ABCA7, INPP50, CD2AP, EPHA1, MS4A6A, PICALM, CD33, HLA, PTK2B, SORL1,SLC24A4, DSG2, MEF2C, NME8, ZCWPW1, SP11, FERMT2, CASS4, TREM2, ABI3, PLCG2*	Lipid metabolism Innate immunity Endosome/lysosome Ubiquitin proteasome
PD	***SNCA***, **PKRN, PINK1, DJ-1, *LRRK2*, ATP13A2, PLA2G6, FBX07, VPS35, DNAJC6, SYNJ1, DNAJC13, *VPS13C***, **RAB39B**, GBA, NUCKS1, ITPKB, SIPA1L2, ILR2, TMEM163, SCNA3A, STK39, SATB1, NCKIPSD, ALS1, CHMP2B, MCCC1, TMEM175, FAM200B, FAM47E, ANK2, ELOVL7, ZNF184, HLA, KLHL7, CTSB, MICU3, SORBS3, SH3GL2, FAM171A1, BAG3, DLG2, MIR4697, OGFOD2, GCH1, TMEM229B, GALLC, CCQ7, ZNF846 TOX3, ATP6VOA1, MAPT, SYT4, LSMT, DDGK1, COMT	Endosome/Lysosome Inflammation (adaptive immunity) Mitophagy Dopamine metabolism Vesicle fusion
ALS	**C9orf72, TARDBP (TDP-43), SOD1, FUS, KIF5A, DCTN1, MATR3, TIA1, CHCHD10, VCP, SQSTM1 (p62), OPTN, UBQLN2, TBK1, CCNF,** *MOBP, SCFD1, SARM, UNC13A, C21orf2*	Axonal transport Mitophagy DNA/RNA metabolism Autophagy/ubiquitin proteasome Toxic aggregation
FTD	**C9orf72, GRN, MAPT, CHMP2B, CHCHD10, VCP, SQSTM1 (p62), OPTN, UBQLN2, *TBK1*, CCNF,** *HLA, TMEM106B, CTSC*	Endosome/Lysosome Autophagy/lysosomal pathway Mitochondrial damage Toxic aggregation Inflammation (adaptive immunity)
HD	**HTT,** MSH3, MTRNR2L2, DHFR	DNA mismatch repair

Bold indicates mendelian genes, *Italics* risk loci and ***Both*** indicates that the locus appears in both categories

Table 2. Regions and neurons vulnerable in neurodegenerative diseases.

Disease	Protein aggregates	Early affected regions	Early vulnerable neurons
AD	$A\beta_{42}$, Tau	LC, TEC, EC, BF, HP	Pyramidal neurons in EC-II & HP-CA1; cholinergic neurons in BF, noradrenergic neurons in LC
PD	α-synuclein	OB, DMV, SNpc	Dopaminergic neurons
ALS	TDP-43, SOD1, FUS, DPRs	MNC, SC, BS	Fast-fatigable motor neurons
bvFTLD	Tau, TDP-43, FUS	ACC, FI	von Economo neurons (VENs)
PiD	Tau	HP, DG	Pyramidal in HP, granular neurons in DG
HD	Huntingtin	ST	medium spiny GABA neurons (MSNs)

AD, Alzheimer's disease; PD, Parkinson's disease; ALS, Amyotrophic Lateral Sclerosis; bvFTLD, behavior variant Frontotemporal lobar degeneration; PiD, Pick's disease; HD, Huntington's disease; $A\beta_{42}$, Amyloid β Peptide (1-42); Tau, microtubule-associated protein tau; TDP-43, TAR DNA-binding protein 43; SOD1, superoxide dismutase 1; FUS, RNA-binding protein Fused in Sarcoma; DPRs, dipeptide repeat proteins related to C9orf72; LC, locus coeruleus; TEC, transentorhinal cortex; EC, entorhinal cortex; BF, basal forebrain; HP, hippocampus; OB, olfactory bulb; DMV, dorsal motor nucleus of the vagus; SNpc, substantia nigra pars compacta; MNC, motor neocortex; SC, spinal cord; BS, brainstem; ACC, anterior cingulate cortex; FI, frontal insula; DG, Fascia dentata of the dentate gyrus; ST, striatum; EC-II, entorhinal cortex layer II; CA1, Cornu Ammonis area 1 of hippocampus.