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Leukaemia Section
Short Communication

t(4;10)(q12;q23) PDGFRA/TNKS2

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Abstract

Comprehensive genomic profiling identifies a novel PDGFRA-TNKS2 gene fusion in a female case of myeloid neoplasm with eosinophilia.

The patient was treated with imatinib, and showed a dramatic and ongoing response with no evidence of disease

Keywords

PDGFRA; TNKS2; fusion gene; chronic myeloproliferative disease; eosinophilia.

Identity

Note

This interchromosomal PDGFRA gene fusion is unlikely to be detected using surrogate CHIC2 deletion FISH testing.

Clinics and pathology

Disease

Myeloid neoplasm with eosinophilia

Epidemiology

One case to date: a 58-year-old female patient (Chalmers et al., 2015).

Treatment

Imatinib mesylate

Evolution

Complet remission, well tolerated response after treatment. No evidence of disease.

Genes involved and proteins

PDGFRA

Location

4q12

Protein

Member of the type III class of tyrosine kinase receptors.

Functions as homo- and/or heterodimers depending on the cell type; activated by ligand-induced dimerization and autophosphorylation.

Subsequent phosphorylation of its substrates initiates a variety of signal transduction cascades that promotes cell proliferation, survival and migration through the PI3K-AKT-mTOR and RAS-MAPK pathways as well as promotes activation of STAT family members (JAK/STAT) (Zamecnikova and Bahar, 2015).

TNKS2

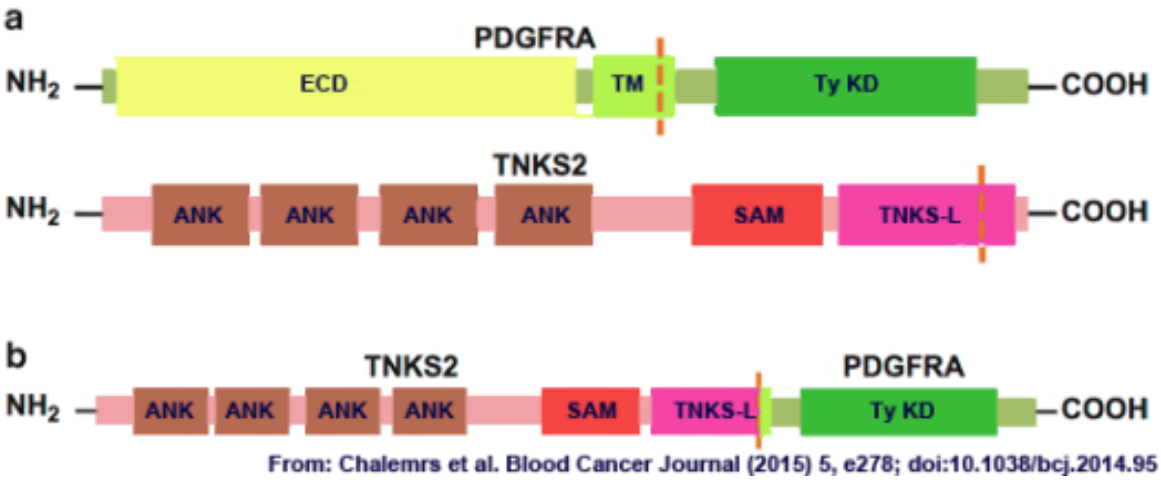
Location

10q23.3

Protein

Belongs to the poly(ADP-ribose)polymerase (PARP) protein super family.

Role in the Wnt/beta-catenin signaling pathway. Roles of TNKS1 and TNKS2 in glucose homeostasis (Guo et al., 2012).



Intrachromosomal rearrangement of TNKS2 and PDGFRA. Fusion gene breakpoints are indicated by orange dashed line. ANK, ankyrin domains; ECD, extracellular domain; SAM, sterile alpha motif; TM, transmembrane; TNKS-L, tankyrase-like; TyKD, kinase domain.

Result of the chromosomal anomaly

Hybrid gene

Description

The hybrid gene fusion is a translocation of TNKS2 and PDGFRA with breakpoint in intron 25 and exon 12, respectively. The discovery of a novel fusion of TNKS2 with PDGFRA further demonstrates the diversity of alterations possible in these myeloid neoplasms with eosinophilia.

Detection

Comprehensive genomic profiling.

Fusion protein

See figure above.

References

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