

t(1;14)(q25;q32)

Identity

Note Chromosome band 1q21-25 is one of the hotspots of chromosomal abnormalities in hematological malignancy. LHX4 gene at 1q25 is a novel gene coding for LIM proteins.

Clinics and Pathology

Disease Only two cases : Case 1: acute pre-B lymphoblastic leukemia (ALL); case 2: biphenotypic blast crisis of a [chronic myelogenous leukemia](#)(CML)

Epidemiology rare

Clinics Case 1: A 53-year-old woman with ALL; case 2: A 52-year-old in CML blast crisis

Cytogenetics

Cytogenetics dup(1)(q21-25) is frequently detected in ALL of B-cell lineage
Morphological

Additional anomalies case 1: associated with t(9;22)(q23 ?;q11) : the breakpoint at 9q23 reported in this paper needs to be confirmed; case 2: 46,XY,t(9;22)(q34;q11)/46, XY,t(1;14)(q25;q32), del(20)(q11;q13.3) / 46,XY, t(1;14)(q25;q32) , add(19)(p13).

Genes involved and Proteins

Gene Name LHX4

Location 1q25.2

Note Alias : Gsh-4. LHX4 gene is a member of the LIM-homeobox gene.

Dna / Rna DNA : 44,66 kb and 6 exons. RNA : 1913 bp

Protein LHX4 protein (40,8kDa, 390 aa) is very close to LHX3.The human LHX4 includes one tandem pair of zinc-finger LIM motifs and one adjacent homeodomain.

Gene Name [IgH](#)

Location 14q32

Result of the chromosomal anomaly

Hybrid gene case 1: the enhancer region of the IgH gene is fused to the 5' regulatory region of the Lhx4 gene in a head-to-head configuration. LHX4 mRNA is expressed at high levels; case 2: the breakpoint fuses the J4 segment of IgH to sequences located 16kb from LHX4 Exon 1 in a head-to-head configuration. LHX4 mRNA is expressed at high levels.

Fusion Protein Note No fusion protein

Oncogenesis LHX4 homeodomain could play an important role as transcriptional regulators in cell regulation, but there is no report about the impairment of hematopoiesis in LHX4 deficient mice and human. There is no report about the transformation activity in the LHX4 gene. Overexpression of LHX2 has been reported in chronic myeloid leukemias and ALL.

External links

Other database [t\(1;14\)\(q25;q32\)](#) [Mitelman database \(CGAP - NCBI\)](#)

Other database [t\(1;14\)\(q25;q32\)](#) [CancerChromosomes \(NCBI\)](#)

To be noted

Additional cases are needed to delineate the epidemiology of this rare entity: **you are welcome to submit a paper to our new [Case Report](#) section.**

Bibliography

A novel chromosomal translocation t(1;14)(q25;q32) in pre-B acute lymphoblastic leukemia involves the LIM homeodomain protein gene, Lhx4.

Kawamata N, Sakajiri S, Sugimoto K, Isobe Y, Kobayashi H, Oshimi K

Oncogene 2002; 21: 4983-4991.

Medline [12118377](#)

Aberrant expression of the LHX4 LIM-homeobox gene caused by t(1;14)(q25;q32) in chronic myelogenous leukemia in biphenotypic blast crisis.

Yamagushi M, Yamamoto K, Miura O

Genes Chromosomes Cancer 2003; 38(3): 269-273.

Medline [14506703](#)

Contributor(s)

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Citation

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