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Leukaemia Section

Short Communication

t(5;7)(q35;q21) TLX3/CDK6

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Clinics and pathology

Disease

T-cell acute lymphoblastic leukemia (T-ALL)

Clinics

Only two cases to date, a 5-year-old girl and a 8-year-old boy (Su et al., 2004).

Cytogenetics

Cytogenetics morphological

The rearrangement was cryptic.

Genes involved and proteins

TLX3

Location
5q35.1

Protein
Transcription factor. TLX3 controls region-specific neuronal identities. TLX3 and TLX1 suppress GABAergic differentiation and promote glutamatergic dorsal horn neurons (Cheng et al., 2004). TLX3 and RUNX1 coordinate the development of a cohort of nociceptors, thermoceptors and pruriceptors (Lopes et al., 2012). TLX3 is required for proper formation of first-order relay visceral sensory neurons, especially involved in the physiologic control of cardiovascular and respiratory systems (Qian et al. 2001). TLX3 is upregulated by Wnt/beta-catenin signaling (Kondo et al., 2011). Calcium signaling regulates neurotransmitter specification.Calcium signaling involves phosphorylation of JUN that regulates TLX3 transcription through a CRE site in its promoter (Marek et al., 2010). TLX3 has been found expressed in 60% of cases in a cohort of childhood T-cell ALL, but not in adult T-cell ALL cases nor in B-cell ALL cases (Mauvieux et al., 2002).

CDK6

Location
7q21.2

Protein
Member of the CDK family; G1-phase kinase; CDK4 and CDK6 are both partners of the 3 D-type cyclins (CCND1, CCND2, CCND3) to phosphorylate pRb; ubiquitously expressed; regulates cell-cycle progression through the G1 phase in proliferating cells; CDK4 and CDK6 are not completely redundant (Grossel and Hinds, 2006).

Result of the chromosomal anomaly

Fusion protein

Oncogenesis
Ectopic expression of TLX3.

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