

Gene Section

Mini Review

IL3 (interleukin-3)

Jean-Loup Huret

Genetics, Dept Medical Information, University of Poitiers, CHU Poitiers Hospital, F-86021 Poitiers, France (JLH)

Published in Atlas Database: December 1999

Online updated version : <http://AtlasGeneticsOncology.org/Genes/IL3ID60.html>

DOI: 10.4267/2042/37555

This work is licensed under a Creative Commons Attribution-Noncommercial-No Derivative Works 2.0 France Licence.
© 1999 Atlas of Genetics and Cytogenetics in Oncology and Haematology

Identity

HGNC (Hugo) : IL3

Location : 5q31

DNA/RNA

Description

5 exons.

Transcription

674 bp transcript with a 458 bp of coding sequence.

Protein

Description

152 amino acids; 17 kDa.

Expression

IL3 is produced by activated T cells, monocytes/macrophages and stroma cells.

Function

Cytokine; multipotent hematopoietic growth factor; induces proliferation, maturation and probably self-renewal of pluripotent hematopoietic stem cells and cells of myeloid, erythroid and megakaryocytic lineages; IL-3 plays a more specialized role on basophil and mast cells; role through activation of the IL-3 receptor (IL-3R) complex consisting of alpha and beta subunits, which in turn induces activation of JAK2/STAT5, and induction of c-myc (cell-cycle progression and DNA synthesis), and activation of the Ras pathway (suppression of apoptosis); IL3 and GM-CSF have overlapping but distinct biological properties.

Implicated in

t(5;14)(q31;q32)

Disease

B-cell acute lymphoblastic leukemia (ALL) with hypereosinophilia.

Prognosis

Poor.

Cytogenetics

t(5;14) may be the sole anomaly or accompanied with other anomalies.

Hybrid/Mutated gene

Break in the promoter region of IL3 and in the Jh region of IgH.

Abnormal protein

The immunoglobulin gene promoter controls the expression of IL3.

Oncogenesis

Over-expression of IL3.

References

Yang YC, Ciarletta AB, Temple PA, Chung MP, Kovacic S, Witek-Giannotti JS, Leary AC, Kriz R, Donahue RE, Wong GG. Human IL-3 (multi-CSF): identification by expression cloning of a novel hematopoietic growth factor related to murine IL-3. *Cell*. 1986 Oct 10;47(1):3-10

Grimaldi JC, Meeker TC. The *t(5;14)* chromosomal translocation in a case of acute lymphocytic leukemia joins the interleukin-3 gene to the immunoglobulin heavy chain gene. *Blood*. 1989 Jun;73(8):2081-5

Nimer SD, Uchida H. Regulation of granulocyte-macrophage colony-stimulating factor and interleukin 3 expression. *Stem Cells*. 1995 Jul;13(4):324-35

Hara T, Miyajima A. Function and signal transduction mediated by the interleukin 3 receptor system in hematopoiesis. *Stem Cells*. 1996 Nov;14(6):605-18

Burdach S, Nishinakamura R, Dirksen U, Murray R. The physiologic role of interleukin-3, interleukin-5, granulocyte-macrophage colony-stimulating factor, and the beta c receptor system. *Curr Opin Hematol*. 1998 May;5(3):177-80

Mangi MH, Newland AC. Interleukin-3 in hematology and oncology: current state of knowledge and future directions. *Cytokines Cell Mol Ther*. 1999 Jun;5(2):87-95

This article should be referenced as such:

Huret JL. IL3 (interleukin-3). *Atlas Genet Cytogenet Oncol Haematol*. 1999; 3(4):183-184.
