

Notch signalling pathways and its associated networks: *In silico* analysis

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The Notch signaling pathway is an evolutionarily conserved, intercellular signaling mechanism essential for cell fate determination and maintenance of progenitors in many developmental systems, and for proper embryonic development in organisms as diverse as insects, nematodes, echinoderms and mammals. Mutations in Notch receptors and components of its signaling pathway have been associated with a number of diseases. Notch proteins are cell surface transmembrane-spanning receptors which mediate critically important cellular functions through direct cell-cell contact. Our aim was to understand the protein interaction network, using Notch1 protein as query in STRING database and we generated a model to assess the significance of Notch1 associated proteins in Leukemia. We analyzed the expression levels of the genes encoding hub proteins, using Oncomine database, to determine their significance. Of the forty two hub genes, we observed that sixteen genes were underexpressed and eleven genes were overexpressed in T-cell Acute Lymphoblastic samples in comparison to their expression levels in normal cells. Notch receptors initiate a highly conserved signaling pathway that influences cell fate decisions within multiple tissues and regulate the ability of precursor cells to respond to other developmental signals. In our study, we observed that these are closely associated functionally, with proteins that are crucial in cell cycle, cell differentiation and apoptosis. Notch receptors have been expressed on hematopoietic progenitor cells as well as to various degrees in peripheral blood T and B lymphocytes, monocytes, and neutrophils. Our study has highlighted the possible interactions through which Notch signaling might lead to uncontrolled proliferation of cells leading to neoplastic transformation.

Biography

Kaiser Jamil completed her Ph.D. at the age of 25 years from Osmania University, is a distinguished Scientist, having worked in 4 renowned Institutions like IICT, CCMB (both premier Institutes of CSIR), University of Sydney (Australia) and at University of Paris (France). As an active researcher, she established multidisciplinary research in biology and expanded into newer areas of R&D. She has guided 25 Ph.D. students and 80-100, B.Sc./B.Tech/M.Tech/ and graduate students for project work, 5 students are still working under her supervision for Ph.D. degree. She has published more than 200 papers in peer reviewed journals of repute. Presently she is the Dean and Director for the Centre for Biotechnology and Bioinformatics, JNIAS, and also holds the additional charge as Head of Genetics division at Bhagwan Mahavir Medical Research Centre, Hyderabad.

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