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Bioinformatics analysis of ATOH7 mutation during retinogenesis

Shouhartha Choudhury and Supriyo Chakraborty

Assam University, India

The present study investigates ATOH7 gene encodes a transcription factor induce determining the fate of retinal progenitor cells and required for optic nerve formation and ganglion cell development. The basic helix–loop–helix transcription factor ATOH7 (Math5) is specifically expressed in the embryonic neural retina and required for the genesis of retinal ganglion cells and optic nerves. The retinal ganglion cells (RGCs) are the first neurons in the vertebrate eyes and conserved during evolution. ATOH7 is highly homologous to the atonal gene family, which is critically required for neuron formation during eye development. The evolutionarily diverse eye types require atonal gene function at the earliest stages of retinal neuron

formation. During retinogenesis, ATOH7 is expressed significantly before NeuroD and Ngn. Retinal neuron differentiation requires both intrinsic and extrinsic factors, yet a few intrinsic gene products have been identified in Homo sapiens, Pan troglodytes, Gorilla, Ailuropoda melanoleuca, and Mus musculus. Our comparative and functional analysis suggested the mutation of ATOH7 and their conserved bHLH domain, motifs, phylogeny, chromosome location, and gene expression. Our bioinformatics analysis can be adapted in a meaningful way to the study of particular genes of interest.

shouharthac@gmail.com