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RCB Scientist delivers seminar on "Myosins in Development and Disease"

By Sunderarajan Padmanabhan

New Delhi, March 25: RCB Scientist Dr. Sam J. Mathew, Associate Professor, delivered a seminar at the National Centre for Biological Sciences (NCBS), Bengaluru on March 4, 2020. During the seminar, the research work done in the laboratory of Dr. Mathew on myosins was highlighted.

Myosin heavy chain-embryonic (MyHC-emb) is a skeletal muscle specific contractile protein expressed during muscle development. Mutations in *MYH3*, the gene encoding MyHC-emb leads to Freeman-Sheldon and Sheldon-Hall congenital contracture syndromes.

The scientist's group characterized the role of MyHC-emb during mammalian development using targeted mouse alleles. Germline loss-of MyHC-emb leads to neonatal and postnatal alterations in muscle fiber size, fiber number, fiber type and mis-regulation of genes involved in muscle differentiation. Deletion of *Myh3* during embryonic myogenesis leads to depletion of the myogenic progenitor cell pool.

They also uncovered that the non-cell autonomous effect of MyHC-emb on myogenic progenitors and myoblasts are mediated by the fibroblast growth factor (FGF) signaling pathway and exogenous FGF rescues the myogenic differentiation defects upon loss of MyHC-emb function in vitro.

Adult *Myh3* null mice exhibit scoliosis, a characteristic phenotype exhibited by Freeman-Sheldon and Sheldon-Hall congenital contracture syndrome patients. Thus, they have identified MyHC-emb as a crucial myogenic regulator during development, performing dual cell autonomous and non-cell autonomous functions.

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