

Ph.D. Proposal Presentation

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Division: Department of Stem Cell Biology

Title of the project: Investigating the Role of Actin Dynamics in Intellectual Disability associated Synaptic Plasticity: Insights from iPSC-derived Neurons

Date & time: 14th October 2025, Dr. Shanta Rao Auditorium at 3.00 p.m.

Abstract

Intellectual Disability (ID), also known as Intellectual Developmental Disorder, accounts for 1-3% of the global population. Among various etiologies, single-gene disorders are one of the important causes of ID. Functional analysis suggests that ID-associated genes may be involved in cytoskeleton dynamics, particularly in the actin organization of neurons. Actin dynamics is regulated by the Rho-GTPase pathway and is involved in various important neuronal functions like growth cone formation, dendritic spine morphogenesis, synaptic plasticity, and neurotransmitter release. Herein, we propose to investigate the effect of novel genetic variants in genes encoding proteins associated with neuronal actin organization and synaptic plasticity. Induced Pluripotent Stem Cells (iPSC) technology offers a more accurate disease model that mimics a patient's cellular and molecular conditions. Hence, we will utilize patient iPSC-derived neurons to study the effect of novel gene variants on neuronal actin organizations and synaptic plasticity.