Project Details	
Project Code	MRCNMH24Ba Subramanian
Title	The rapidly aging African Turquoise killifish as a model for age related neurodegenerative disorders
Research Theme	Neuroscience & Mental Health
Summary	In this PhD project the student will investigate Ribostasis and its regulation in the rapidly aging African Turquoise killifish, the shortest lived vertebrate. The project will apply cutting edge molecular and imaging tools such transcriptomics and high resolution imaging.Dysfunction or loss of regulation of Ribostasis is a key process driving aging and is a hallmark of many age related disorders and is a relatively underexplored area of research.
Description	Aging-related neurodegenerative diseases are progressive and fatal neurological diseases that are characterized by irreversible neuron loss and gliosis. With a growing population of aging individuals, there is a pressing need to better understand the basic biology underlying these diseases. Although diverse disease mechanisms have been implicated in neurodegeneration, a common theme of altered RNA processing has emerged as a unifying contributing factor to neurodegenerative disease. RNA processing includes a series of distinct processes, including RNA splicing, transport and stability, as well as the biogenesis of non-coding RNAs.Some of these mechanisms are altered in neurodegenerative disease, including the mislocalization of RNA-binding proteins and their sequestration induced by microsatellite repeats, microRNA biogenesis alterations and defective tRNA biogenesis, as well as changes to long-intergenic non-coding RNAs. Using the novel, rapidly aging African Turquoise Killifish (N.furzeri) which the shortest lived vertebrate, this PhD project aims to investigate how RNA homeostasis is maintained by the complex interplay of transcriptional, and post-transcriptional regulation in the aging brain and eye. For this we will use ATAC-sequencing, with genome-wide analysis of DNA methylation and hydroxymethylation, Pol II chip-sequencing combined with nascent RNA-sequencing (GRO-seq), Nanopore sequencing for splicing changes and map RBP-RNA interactions across the transcriptome during aging and bioinformatics analysis
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