Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Internal Webinar

A Genetic screen to identify the novel regulators of mitochondrial biogenesis and mitochondrial dynamics

Sonia Sandhi

TIFR, Hyderabad

Mitochondria, primarily known for its role in energy production, are essential for cell survival. Therefore, its form, abundance, quality and distribution is highly regulated. There are various processes involved in maintaining mitochondrial homeostasis which includes mitochondrial biogenesis and mitochondrial dynamics. Recent studies have shown that perturbations in mitochondrial homeostasis correlate with the progression of numerous degenerative diseases such as Alzheimer's, Huntington's, Parkinson's etc. There are several proteins involved in maintaining mitochondrial homeostasis but their regulation is not well understood. Due to physiological and pathophysiological implications of the regulation of mitochondrial homeostasis, it needs to be studied more thoroughly.

With the aim to find out novel regulators of mitochondrial biogenesis and mitochondrial dynamics, we are doing an unbiased forward genetic screen in Drosophila. Using immunostaining, we are looking at mitochondrial complex V and Marf levels as readouts for mitochondrial biogenesis and mitochondrial dynamics, respectively. Till now we have screened 37 mutants for CoV levels, out of which 8 mutants have shown a change while out of 25 mutants screened for Marf levels, 8 show a change. Some of these positive hits have not been previously known to be related to any process involved in mitochondrial homeostasis.

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