Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

Webinar

Ubiquitin-dependent protein degradation to ubiquitin degradation - An emergency role of Proteasomes under physiological stress

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Protein degradation is an essential process for all living forms to survive. All eukaryotes majorly utilise Ubiquitin-Proteasome system (UPS) to degrade damaged, non-functional & retired proteins; and thereby maintain protein homeostasis to carry out the cellular processes. In general, proteins are degraded when tagged by a small protein – "Ubiquitin" and brought to a degradation machine – "26S proteasome" that proteolyses the target proteins into peptides and releases the ubiquitin tag. But, at times of emergency or certain cellular stress when 26S proteasomes become non-functional, cells rely on a smaller machine – "20S proteasome" which degrades proteins in a ubiquitin-independent manner. We recently discovered that under oxidative stress and human heart failure 20S proteasome becomes the major protease and alleviates the hypoxia-induced proteotoxicity for survival. During this emergency, surprisingly the tagged ubiquitins are degraded as collateral damage.

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