National Institute of Technology Rourkela

Registration Seminar

Seminar Title	: Mechanistic insights into MTP18-dependent mitochondrial dynamics and apoptotic machinery for mitochondrial quality control
Speaker	: Pratyasha Mahadani (Rollno : 523ls6009)
Supervisor	: Sujit Kumar Bhutia
Venue	: LS Seminar Room
Date and Time	: 24 Jul 2025 (4.00PM)
Abstract	: Mitochondria are the key players in maintaining cellular health by critically regulating metabolism processes, stress adaptation through cellular survival, and redox balance. They govern these by a synchronized process of mitochondrial homeostasis through fission and fusion cycles, facilitating a segregation of dysfunctional mitochondria from a healthy population and enabling either their repair or destruction by targeting them through the mitophagy pathway. However, excessive stress also leads to their clearance through mitochondrial apoptosis facilitated by membrane permeabilization and the initiation of the intrinsic apoptotic cascade. So, in this study, we have explored the mechanistic modulation of these phenomena through a therapeutic compound, Butein, a phytochemical found in the plant *Butea monosperma*, well-known to show anti-inflammatory and anti-oxidant properties. Butein significantly upregulated MTP18 and DRP1-mediated mitochondrial fission and augmented PINK1-PARKIN-dependent mitophagy pathway. This finding was integrated with the previously reported cytotoxic effect of Butein, as it triggered a caspase-3-dependent increase in apoptosis and cytochrome c release. Thus, we have explored the dual role of Butein in the clearance of impaired cellular populations while maintaining a pro-survival advantage for the healthy mitochondria. Therefore, this balance was found to be a major driver for restraining cancer progression in a compromised environment of mitochondrial health.