MONDAY

COLLOQUIUM

Light activation and timing mechanisms that underlie eukaryotic circadian clocks

Brian Crane (Cornell University, NY)

24 Feb 2025 (Monday) | 16:00 Hrs (Tea / Coffee 15:45 Hrs) | Venue: TIFRH Auditorium

Eukaryotic circadian clocks are cell-autonomous molecular timing circuits that can be entrained to environmental conditions, most commonly light. In humans, clock dysfunction is linked to sleep abnormalities, mental disorders, metabolic disease, and cancer. Clocks are based on transcription-translation feedback loops, wherein transcription factors activate clock-controlled genes, among which, several code for repressor proteins that directly oppose the activators. Light-sensitive cofactor-containing proteins either upregulate the activators or promote degradation of the repressors. We aim to understand how the structures and dynamics of the protein complexes formed between clock activator and repressor proteins are modulated by light and posttranslational modification. In particular, photoactivation of cryptochromes and their targeting will be discussed, along with a potential role for protein phase separation in circadian timing.

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