



Department of Biology

The College of Arts + Sciences | Indiana University Bloomington

Distinguished Alumni Award Lecture

Thu., Oct. 18, 2018 • 4 to 5 pm • Myers Hall 130

Paul Hardin, Ph.D.

John W. Lyons Jr. '59 Chair in Biology, Texas A&M University

Genetic architecture underlying circadian clock initiation, maintenance, and output in *Drosophila*

Circadian clocks drive daily rhythms in metabolism, physiology, and behavior in organisms ranging from cyanobacteria to humans. The identification and analysis of “clock genes” in *Drosophila* revealed that circadian timekeeping is based on a transcriptional feedback loop in which CLOCK-CYCLE (CLK-CYC) heterodimers activate transcription of their feedback repressors PERIOD (PER) and TIMELESS (TIM). Subsequent studies revealed that similar transcriptional feedback loops keep circadian time in all eukaryotes and, in the case of animals, that these feedback loops are comprised of conserved components. The “core” feedback loop described above operates in conjunction with an “interlocked” feedback loop in animals to drive rhythmic transcription of hundreds of genes that are maximally expressed at different phases of the circadian cycle. These feedback loops operate in many, but not all, tissues in flies including the brain pacemaker neurons that control rest:activity rhythms. Recent studies in Hardin’s lab have focused on how these feedback loops are initiated in pacemaker neurons during development and defining the role interlocked feedback loops play within the fly clock. He will discuss how this work reveals a “non-clock” role for CLK protein, requirements for initiating feedback loop function, and a critical role for the interlocked loop in driving rest:activity rhythms.

Hosted by the faculty of the Department of Biology
Refreshments served prior to lecture; reception held immediately after seminar

About Paul Hardin



Paul Hardin studied the development of the sea urchin embryo in William Klein’s lab at Indiana University, from where he received his Ph.D. in 1987. He did his postdoctoral fellowship with Michael Rosbash at Brandeis University, working on the circadian rhythms of the fruit fly, *Drosophila melanogaster*. His work with Michael Rosbash and Jeff Hall has been instrumental to our understanding of how circadian rhythms affect a myriad of animal behaviors. Hardin’s contributions to fly chronobiology were important to the awarding of the 2017 Nobel Prize in Physiology or Medicine to Professors Rosbash and Hall. Hardin is currently a Distinguished Professor as well as the John W. Lyons Jr. '59 Chair in the Biology Department at Texas A&M University.

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