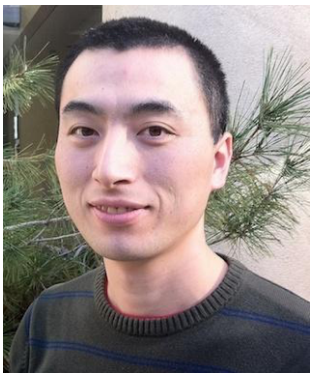
School of Natural Sciences

UCMERCED

Quantitative Systems Biology Seminar Series

A Dynamic Day of a Three-Protein Circadian Clock



By Yonggang Chang

School of Natural Sciences

University of California, Merced

Date:

Friday,

9/23/16

Time:

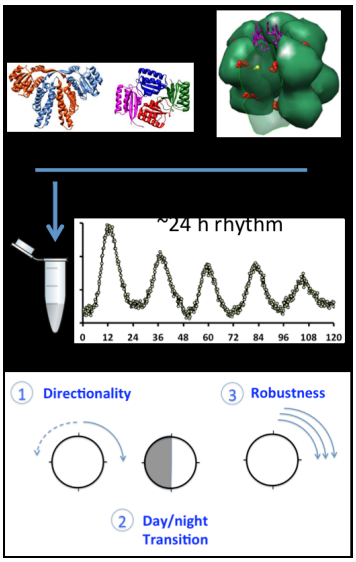
1:30pm

Location:

COB 267

Abstract:

As the saying goes, timing is everything. Organisms on Earth have evolved circadian (~24-h) clocks to tell time, in synchronizing their physiology and behavior with environmental changes such as light and temperature. The cyanobacterial clock has become a model system for mechanistic understanding of biological timekeeping since it can be reconstituted in a test tube by simply mixing its three components, KaiA, KaiB, and KaiC, with ATP. We have been using biophysical and biochemical techniques, such as NMR, to study structure and dynamics of its individual components and their temporal assembly and disassembly. In this talk, I will present our work that provides insight into the molecular basis of three features of circadian clocks: (1) directionality - why circadian clocks don't go counterclockwise; (2) day/night transition - what is the nightfall signal and its sensing; and (3) robustness – how circadian clocks can keep ticking.



Bio:

Yonggang completed his BSc at Sichuan University, China, in 2001. He began his PhD studies in 2002 at the Shanghai Institute of Biochemistry and Cell Biology, gaining his doctorate in 2008. At S.I.B.C.B., his major research was on how the NS1B protein of Influenza B Virus antagonized the anti-viral protein ISG15 in the human host cell. This particular focus led to his passionate interest in the structure and dynamics of proteins and protein-protein interaction. In 2009, Yonggang took up his current position of post-doctoral research associate at University of California, Merced, under the supervision of Dr. Andy LiWang. Research in Dr. LiWang's lab endeavors to understand inherent biological timekeeping mechanisms, using the cyanobacterial circadian clock (which can be simply reconstituted in vitro) as a model system.

Dr Chang's career at U.C. has been enhanced by intensive training in protein structure and dynamics using Nuclear Magnetic Resonance under the supervision of Dr. LiWang who, himself, is an NMR spectroscopist. Dr. Chang's acknowledged research and journal publications have contributed significantly to the on-going task of unlocking the mysteries of biological timekeeping. Dr. Chang's long-term goal is to gain an understanding of the atomic origins of human circadian clocks which affect us all in terms of, for example, sleep disorders, disruptions of natural circadian rhythms and their relation to cancer cells and, not least, jet lag.

For More Information Contact:

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