
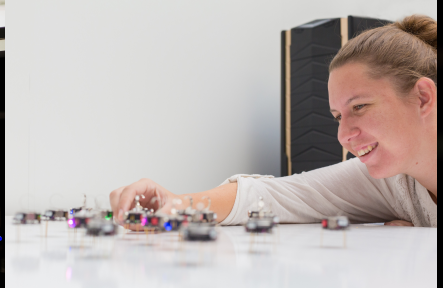


Physics colloquium

The Mechanism and Regulation of Dynein Motility

Ahmet Yildiz
Department of Physics
University of California Berkeley

Date: **4/19/19**
Time: **10:30 AM**
Location: **COB2 170**

For more information contact
Jing Xu
jxu8@ucmerced.edu

Abstract: Cytoplasmic dynein is an AAA+ motor responsible for motility and force generation functions towards the microtubule minus end. In comparison to kinesin and myosin motor families of the cytoskeleton, the mechanism of dynein motility was not well understood due to the complexity of its structure and massive size. Using single-molecule imaging methods, we presented a robust mechanistic model of how dynein steps along microtubules and generates force and identified a unique ATPase site that repurposes dynein for different cellular functions. We also reversed the direction of dynein motility by protein engineering, which explained why all dyneins move towards the microtubule minus-end. These results establish a comprehensive model for how dynein functions as a motor and transports cargos in cells.

Bio: Ahmet Yildiz received his Ph.D. in biophysics at the University of Illinois Urbana-Champaign in 2004. During his Ph.D., he developed a single fluorescent particle tracking method with one-nanometer accuracy and showed how molecular motors of cytoskeleton walk along linear tracks inside cells. He completed his postdoctoral work with Ron Vale at the University of California San Francisco as a Jane Coffin Childs, and Burroughs Wellcome Fellow. His work in single molecule fluorescence has been awarded Gregory Weber International Prize in Biological Fluorescence in 2005 and the Young Scientist Award by Science Magazine in 2006. In 2008, he joined the physics department at UC Berkeley. His research group develops biophysical approaches to study the mechanism of macromolecular machines, such as dynein, Cas9, and telomerase at a single molecule level. His research has been recognized recently with the NSF CAREER Award, Presidential Early Career Award, Sloan Fellowship, EMF Young Investigator Award, ASCB Emerging Leader Prize, Barany Award by BPS, and the Vilcek Prize.