NUS National University of Singapore | Department of Biological Sciences, Faculty of Science

VIRTUAL BIOLOGY COLLOQUIUM

Friday, 27 May 2022 | 9 am | Online Zoom Session

Hosted by Dr Phua Siew Cheng

How cells distinguish ciliary and nonciliary signals

By **Jeremy Reiter**

University of California, San Francisco

Cells use the primary cilium, an ancient, mysterious organelle, for intercellular communication. In most cell types, the primary cilium is a solitary projection which, like your radio antenna, tunes cells to receive different information depending on which receptors they contain. Human cilia mutations cause diseases called ciliopathies, and understanding these rare, inherited diseases illuminates how defective ciliary signaling also contributes to common diseases, including types of cancer and obesity. Recently, we have helped reveal that cells differentially interpret second messengers generated inside and outside the cilium. This work sheds light on how cells distinguish subcellular cues and how a limited repertoire of signaling pathways interpret a multiplicity of signals.

About the Speaker

Dr. Jeremy Reiter, MD, PhD, earned his MD and PhD here at UCSF. For his thesis work with Dr. Didier Stainier, Dr. Reiter identified genetic regulators of heart and gut development. During a postdoctoral fellowship with Dr. Bill Skarnes at UC Berkeley, Dr. Reiter developed gene editing technology to explore mammalian development. The work from his independent lab has helped reveal that primary cilia, small antennae-like structures present on almost all human cell types, are sensors of diverse intercellular cues. Their work has also shown that cancer cells can be ciliated and addicted to their cilia for uncontrolled proliferation. More recently, the Reiter lab has illuminated how the lipid and protein composition of the cilium is generated to allow it to function as a specialized signaling organelle, and some of the ways in which altering ciliary function causes diseases as diverse as neural tube defects, inherited forms of obesity and polycystic kidney disease. Additionally, Dr. Reiter serves as the Chair of the Department of Biochemistry and Biophysics.

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