TEMS

Temasek External Monthly Seminar

TEMASEK LIFESCIENCES LABORATORY

ALL ARE WELCOME

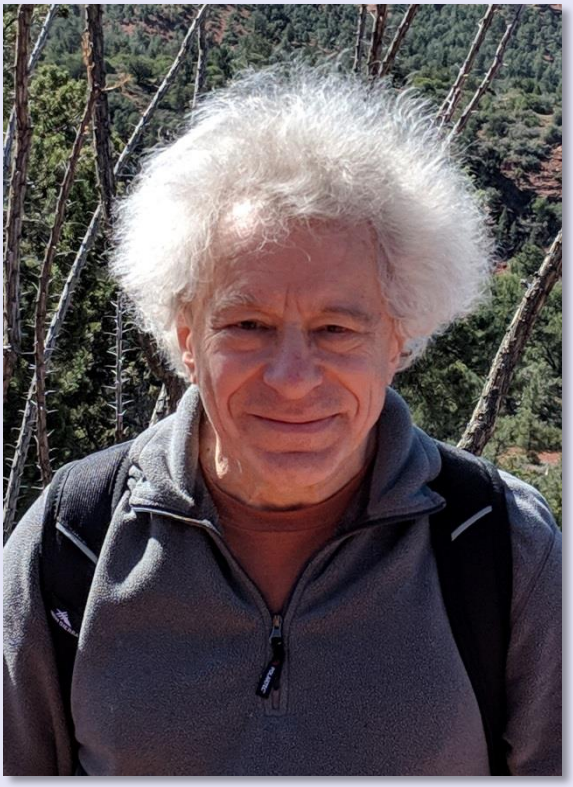
16 September 2019 (Monday), 3pm

The Auditorium (Level 1)

Hosted by: Dr Yu Fengwei

How microtubules and motor proteins drive and control neurite outgrowth

Prof. Vladimir I. GELFAND
Northwestern University, United States



Microtubules play many roles in morphological differentiation of neurons and maintenance of neuronal homeostasis. Their well-known and extensively characterized role is to serve as tracks for molecular motors that deliver many types of cargoes along long neuronal processes, axons and dendrites. Less is known about the role of microtubules and microtubule motors play in establishing characteristic neuronal cell shape and in the formation of axons and dendrites. In this talk we will discuss how molecular motors and microtubules drive neurite extensions and how motors sort and organize microtubules in axons and regulate microtubule dynamics. We will also discuss and compare the roles of motor proteins in microtubule organization in the neuronal cytoplasm and in the mitotic spindle.

Vladimir Gelfand is Leslie B. Arey Professor of Cell and Developmental Biology at the Northwestern University in Chicago. The primary scientific interest of the Gelfand lab is biological functions of microtubule motors. The main question that we are trying to address is how microtubule motors define polarity of cells. Three biological models studied in the lab are *Drosophila* oogenesis, morphological differentiation of *Drosophila* neurons and the role of microtubules in organization of intermediate filaments in mammalian cells.

Recent Publications:

1. Ooplasmic flow cooperates with transport and anchorage in *Drosophila* oocyte posterior determination.
Lu W, Lakonishok M, Serpinskaya AS, Kirchenbüechler D, Ling SC, **Gelfand VI**. J Cell Biol. 2018 Oct 1;217(10):3497-3511. doi: 10.1083/jcb.201709174. Epub 2018 Jul 23.

2. Role of kinesin-1-based microtubule sliding in *Drosophila* nervous system development.
Winding M, Kelliher MT, Lu W, Wildonger J, **Gelfand VI**. Proc Natl Acad Sci U S A. 2016 Aug 23;113(34):E4985-94. doi: 10.1073/pnas.1522416113. Epub 2016 Aug 10.

3. Interplay between kinesin-1 and cortical dynein during axonal outgrowth and microtubule organization in *Drosophila* neurons.
del Castillo U, Winding M, Lu W, **Gelfand VI**. Elife. 2015 Dec 28;4:e10140. doi: 10.7554/eLife.10140.