TEMS

Temasek External Monthly Seminar

TEMASEK LIFESCIENCES LABORATORY

ALL ARE WELCOME

04 December 2018 (Tuesday), 3.00pm
The Auditorium (Level 1)

Hosted by: Ms TANG Quan

Axon Degeneration in Development and Disease

Prof Marc FREEMAN
Vollum Institute, United States



Nervous system injury can have devastating long-term effects on circuit function, but signaling pathways that regulate nervous system responses to injury, especially in early acute phases, remain poorly defined. Cellular responses to injury are an old feature of metazoans, and we have been using *Drosophila* to understand the mechanistic basis of injury signaling. This presentation will cover our growing molecular understanding of pathways that drive axon degeneration, neuron-glia signaling during trauma, and the spreading of injury signals throughout the nervous system.

Marc Freeman is Director of the Vollum Institute. He earned his B.S. in Biology from Eastern Connecticut State University in 1993. He carried out his doctoral training in the laboratory of John Carlson at Yale University, where he studied *Drosophila* olfaction. Freeman trained as a postdoctoral associate with Chris Doe at the University of Oregon from 1999–2004, studying *Drosophila* embryonic neurogenesis. He started his laboratory in the Department of Neurobiology at The University of Massachusetts Medical School in 2004. Freeman was selected as a Smith Family New Investigator (2004), an Alfred P. Sloan Research Fellow (2005), and a Howard Hughes Medical Institute Early Career Scientist (2009–2013). He was an HHMI Investigator from 2013 to 2016, until he moved to the Vollum Institute in 2016.

Recent Publications:

1. MacDonald JM, Beach MG, Porpiglia E, Sheehan AE, Watts RJ, **Freeman MR**. The Drosophila cell corpse engulfment receptor Draper mediates glial clearance of severed axons. *Neuron*. 2006 Jun 15;50(6):869-81. PubMed PMID: 16772169.
2. Osterloh JM, Yang J, Rooney TM, Fox AN, Adalbert R, Powell EH, Sheehan AE, Avery MA, Hackett R, Logan MA, MacDonald JM, Ziegenfuss JS, Milde S, Hou YJ, Nathan C, Ding A, Brown RH Jr, Conforti L, Coleman M, Tessier-Lavigne M, Züchner S, **Freeman MR**. dSarm/Sarm1 is required for activation of an injury-induced axon death pathway. *Science*. 2012 Jul 27;337(6093):481-4. PubMed PMID: 22678360.
3. Neukomm LJ, Burdett TC, Seeds AM, Hampel S, Coutinho-Budd JC, Farley JE, Karadeniz YB, Osterloh JM, Sheehan AE, **Freeman MR**. Axon death pathways converge on Axundead to romote functional and structural axon disassembly. *Neuron*. 2017 Jul 5;95(1):78-91 PMID: 28683272
4. Tasdemir-Yilmaz OE, **Freeman MR**. Astrocytes engage unique molecular programs to engulf pruned neuronal debris from distinct subsets of neurons. *Genes Dev*. 2014 Jan 1;28(1):20-33. PubMed PMID: 24361692; PubMed Central PMCID: PMC3894410.