TEMS

Temasek External Monthly Seminar

TEMASEK LIFESCIENCES LABORATORY

ALL ARE WELCOME

28 November 2016 (Mon), 11am

The Auditorium (Level 1)

Hosted by: Dr Fumio MOTEGI

Remodeling of C. *elegans* primordial germ cells through endoderm-assisted cannibalism

Dr Jeremy Nance
New York University, United States



Primordial germ cells (PGCs) undergo unique regulation to preserve their fate as precursors to the germ line. A conserved but poorly understood aspect of PGC development is an intimate association with endodermal cells. PGC-endodermal interactions have been described in a wide variety of invertebrate and vertebrate animals, but the significance of these interactions is largely unknown. I will present our findings that C. *elegans* PGCs form organelle-rich lobes that are removed and digested by adjacent endodermal cells, dramatically altering PGC size and content. Endodermal cells do not scavenge shed PGC lobes, but rather, actively bite lobes from the PGC cell body. CED-10/Rac1-induced actin, DYN-1/dynamin, and LST-4/SNX9 transiently surround lobe necks and are required within endodermal cells for lobe scission, suggesting that scission occurs through a mechanism resembling vesicle endocytosis. These findings reveal an unexpected role for endoderm in altering the size and contents of embryonic PGCs, and define a novel form of developmentally programmed cell remodeling involving intercellular cannibalism.

My lab utilizes the C. *elegans* embryo as a model system to learn how tissues and organs form and change shape during development. We have focused on several different morphogenetic events and the cell polarization events that underlie them, including gastrulation, epithelial cell formation, and organ assembly. I will discuss recent work on assembly of the gonad during embryonic development, and the surprising cellular interactions that control this process.

Our research: http://nancelab.med.nyu.edu/

Recent Publications:

1. D. Chihara and **J. Nance**. An E-cadherin-mediated hitchhiking mechanism for C. *elegans* germ cell internalization during gastrulation. Development 2012: 139: 2547-2556.
2. M. R. Rohrschneider and **J. Nance.** The union of somatic gonad precursors and primordial germ cells during C. *elegans* embryogenesis. Developmental Biology: 2013: 379: 139-151 (cover photo).
3. D. Klompstra, D. C. Anderson, J. Y. Yeh, Y. Zilberman, and **J. Nance**. An instructive role for C. *elegans* E-cadherin in translating cell contact cues into cortical polarity. Nature Cell Biology 2015: 17: 726-735.