

Biological Statistics and
Computational Biology

Weill Institute for Cell
and Molecular Biology

Candidate for Cellular Systems Biology Position

Ed Munro

University of Washington

Monday, March 16, 2009

10:00 – 11:00 am

226 Weill Hall, above Synapsis Cafe

Dynamics of cell polarization and morphogenesis in early embryos.

Biologists have made rapid progress in identifying and characterizing the molecular networks that “control” embryonic development. A current challenge is to understand how these networks operate in the physical context of living embryos to orchestrate complex cell and tissue level behaviors. I address this challenge through studies of cell polarization and cellular morphogenesis in early embryos, combining quantitative microscopy and experimental manipulations with detailed agent-based computer simulations. In this talk, I will highlight one of these areas: how interactions among PAR proteins, small GTPases and actomyosin endow the *C. elegans* zygote with the ability to establish and then maintain cortical polarity in response to a transient localized cue. I will also touch briefly on our efforts to understand how the interplay between polarized motility, contractility and cell-cell adhesion underlie robust mechanisms for invagination and convergent extension in ascidians.

Short Bio:

Ed Munro has had a long-term interest in interdisciplinary approaches to Biology. As an undergraduate at Hampshire College, he pursued parallel studies in Mathematics and Biology. As a graduate student with Garry Odell in the Zoology Department at the University of Washington, he drew these threads together, combining experimental and computational approaches to study the dynamics of embryonic pattern formation and morphogenesis. After a brief postdoctoral stint with Jim Priess at the Fred Hutchinson Cancer Research Center, where he learned to work with *C. elegans*, Munro co-founded the Center for Cell Dynamics (CCD), an NIGMS Center of Excellence dedicated to the fusion of experimental and computational biology. In addition to pursuing independent research on cell polarization and morphogenesis at the CCD, Munro has been active in developing an interdisciplinary training program, and in developing methods and software for agent-based simulations of cell and tissue dynamics.

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