Rapid Evolution of a Novel Actin-Related Protein Arp2D in Drosophila Pseudoobscura

Isabel Mejia Natividad, Courtney M. Schroeder, John R. Valenzuela, and Harmit S. Malik

Basic Sciences Division, Fred Hutchinson Cancer Research Center, imejaniatividad@pugetsound.edu

Background

- Actin is an evolutionarily ancient cytoskeletal protein that is critical for many architectural and signaling roles.
- Before the last common ancestor of eukaryotes, actin genes duplicated and diversified into the superfamily of actin-related proteins (Arps) with diverse functions.

Arp2D Evolution

- D. pseudoobscura produces heteromorphic sperm
- Only long sperm are fertilization competent
- Is Arp2D important in the development of one form of sperm (long versus short)?

Approach: Examine expression of Arp2D in long versus short cysts

Results:

Is Arp2D expressed more frequently in one sperm class than the others?

Current Questions

Current Questions

- Does reduced expression of Arp2D impede motility of actin cones?
- Does Arp2D alleviate genetic conflict by playing a meiotic role, while Arp2 plays somatic roles?
- Is Arp2D expressed during meiosis in D. pse and compete with Arp2D?

Acknowledgements

This work is funded by the Jane Coffin Childs Memorial Fund, the NIH grant R01GM074108 and the Howard Hughes Medical Institute. The Summer Undergraduate Research Program is supported in part by the Cancer Center Support Grant (CCSG) CURE Supplement: NCI 3P30CA015704, the Fred Hutch Internship Program, and Malik Lab.