Abstracts

Development and evolution

Program/Abstract # 237
Gastrulation in Parhyale hawaiensis: How do they do it?
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Although previous studies point to gastrulation as a critical time in fate determination during the development of Parhyale hawaiensis, an amphipod crustacean, little is understood about its mechanistic and molecular aspects. P. hawaiensis gastrulation begins with internalization of a small group of mesoderm and germline precursors that form a structure called the rosette. During the process of gastrulation, the rosette comes to lie beneath an epithelial cell sheet comprised of ectodermal precursors. We are interested in determining which population of cells actively migrates and defining the mechanistic and molecular pathways that initiate and regulate this migration. Preliminary cell-labeling and time-lapse video of each population suggest an active role on the part of both the ectoderm and the rosette. Molecularily, prospective mesoderm markers such as the P. hawaiensis homologs of the Drosophila genes snail and twist are not expressed until after gastrulation is finished. The late expression of these genes indicates that new molecular markers must be isolated in order to differentiate and manipulate the rosette and ectodermal sheet as well as expression and manipulation studies of candidate conserved genes involved in epithelial migration.

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Segmentation in the intermediate germ band insect, Oncopeltus fasciatus
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The insect body plan is highly conserved and is composed of iterated units called segments. However, the developmental process leading to this segmented body plan is quite different between different insects. In long-germ insects such as Drosophila melanogaster, all the body segments are specified nearly simultaneously while in short and intermediate germ insects, only the anterior-most segments are initially specified. In short germ insects, the rest of the body segments are added sequentially, through a period of posterior growth. I am studying the role of several conserved segmentation genes in patterning the embryo of an intermediate germ insect, Oncopeltus fasciatus. By using in situ hybridization to determine expression domains and RNA-mediated interference (RNAi) to dissect gene function, we have found similarities and differences in how these genes are used in development. Moreover, RNAi is a convenient method of studying epistatic relationships in Oncopeltus and there-

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