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Abstracts

Morphogenesis

Program/Abstract # 406
Dynein is required for epithelial polarity and the apical localization of stardust mRNA

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Intense investigation has identified an elaborate protein network controlling epithelial polarity, however little is known about how the individual apical and basolateral determinants become polarized in the cell. Through a screen for epithelial defects in the *Drosophila* ovary, we have found that the Cytoplasmic Dynein motor is an essential regulator of apico-basal polarity. Since Dynein is known to ferry cargoes toward the apical surface in epithelia, we hypothesized that the loss of apico-basal polarity observed in Dynein-deficient cells could result from the mis-trafficking of one or more of the known apical determinant proteins. Our data indicate that Dynein acts through the cytoplasmic scaffolding protein Stardust (Sdt) to localize the transmembrane protein Crumbs (Crb) during early oogenic stages, likely through the apical targeting and localized translation of the *sdt* mRNA. We have mapped the *sdt* localization signal to an alternatively spliced coding exon and have observed a developmental switch during which the *sdt* mRNA becomes uniform at later oogenic stages. These results introduce a new class of gene products, mRNAs, to the existing paradigm for apico-basal polarity regulation and suggest that *sdt* mRNA localization may play a key role in the establishment of epithelial polarity. We will discuss how these two modes of *sdt* mRNA localization contribute to the maturation of epithelia during development.

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Program/Abstract # 407
Rho GTPase is required for distinct steps in epithelial tube morphogenesis

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Many organs consist of epithelial tubes, yet the mechanism by which tubes form is not well understood. Here, we report that the small GTPase, Rho, is required for three distinct steps in morphogenesis of the *Drosophila* embryonic salivary gland, which consists of a pair of epithelial tubes. Gland morphogenesis begins by invagination of the primordial cells from the embryo surface followed by cohesive migration of the internalized gland. We show that Rho GTPase is required to maintain apical polarity in the early gland epithelium, invagination and posterior migration. We show that Rho maintains apical polarity through stabilization of Crumbs (Crbs) at the apical lateral membrane and epistasis analysis places Crbs downstream of Rho. Crbs in turn, is required for apical localization of non-muscle myosin II during Rho-mediated invagination of gland cells. After invagination is complete, Rho is again required for contraction of the proximal tip of the gland that results in the posterior migration of the gland. Our studies provide the first evidence for Rho in maintenance of apical polarity and of a functional link between Rho and Crbs. Our studies also reveal that Rho-mediated contraction is necessary both for invagination and migration of the salivary gland.

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Program/Abstract # 408
turtle, a novel immunoglobulin superfamily member, is required for dendrite morphogenesis in a subset of *Drosophila* PNS sensory neurons

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Dendrites function as the primary sites of synaptic and/or sensory input and integration in the developing nervous system, thus, elucidating the molecular mechanisms governing dendrite morphologies is critical to our understanding of how diverse cell-type-specific dendritic morphologies arise and further, how these morphologies may affect biological events such as sensory perception, learning, memory, aging, and nervous system disease pathologies. Here we report the molecular genetic characterization of *Drosophila turtle* (*tutl*), a gene encoding a nervous system-

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