C. elegans excretory tubes, the terminal tubes of the Drosophila tracheal (respiratory) system, and the seamless endothelial tubes present in vertebrate capillary beds, form within single cells by a mysterious "hollowing out" process. Although there is a long history of observational studies of seamless endothelial tubes, documenting their lumenization as well as their relative frequency and ultrastructure, there is little if any understanding of the genetic and molecular pathways required to make these remarkable tubes, or to control the diameter, length or shape of the tube lumens. We have combined forward genetics with mosaic analysis to identify genes that are required cell autonomously within Drosophila tracheal terminal cells for the generation of seamless tubes of proper morphology. Characterization of classes of mutants that perturb tube formation, lumen shape, or gas-filling will be presented.

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Program/Abstract # 468
Epithelial integrity requires a signal from underlying stroma: The nephric coelomic epithelium as a novel experimental model
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Epithelial integrity needs to be correctly established and maintained during organogenesis. In most cases, an epithelial cell sheet is underlain by a stromal tissue that might contain a variety of cells. Interactions between epithelial and stromal components are postulated to be critical for the epithelial integrity. However, molecular and cellular mechanisms governing such interactions remain largely unknown mainly because few model systems are available to study in vivo. We here present the nephric coelomic epithelium (NephCE) as a novel experimental model to address these questions. The NephCE, derived from the coelom, constitutes a single layer of cells with typical apico-basal polarity. These cells enclose a developing mesonephros derived from a different origin, the intermediate mesoderm (IMM), that is filled with mostly nephric tubules and few other cells. In this study, the entire component of IMM-derived mesonephros is considered to be the underlying stroma for NephCE. We have found by perturbing the stroma with tubular ablation that the NephCE requires the underlying tubules as stroma for the epithelial integrity. Without the stromal tubules, NephCE exhibits an abnormal distribution of basement membrane (BM) on their basal side, and becomes more susceptible to EMT-inducing factors including Snail-2. These phenotypes are restored when a piece of matrigel, composed of constituents of BM, is implanted into the stromal region. This suggests that the BM provided by the stroma, most likely by the nephric tubules, functions as a stromal factor to maintain the integrity of the NephCE.

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Program/Abstract # 469
Utilizing a small molecule screen to delineate kidney development
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Chemical screens provide a valuable approach for discovering compounds capable of influencing development. With the identification of candidate compounds, it is possible to define the temporal