Dissecting the intercellular forces shaping tissues

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During embryonic morphogenesis, tissue shape arises from interactions between cells. In tissues, the spatial patterning of cellular surface stresses generated by myosins interplays with intercellular adhesion to yield complex shapes. Here, I will present recent work examining interactions between cells in vivo and in vitro in small and large cell aggregates.

To study the interplay between cortical tension and intercellular adhesion, we examine the early *C Elegans* embryo, in which clear mechanical differences exist between the different cell lineages that arise from asymmetric division in the one cell embryo. We explore how dynamic changes in cell arrangement arise from dynamic mechanical and adhesive changes occurring during development.

While in plane stresses acting during development have received considerable interest, little is known about out-of-plane mechanics in planar tissues. Yet, epithelial monolayers are thought to generate active torques due to the polarized distribution of myosin molecular motors along their apico-basal axis. However, the amplitude of those torques and the bending modulus of monolayers have never been measured, making the contribution of out-of-plane forces to morphogenesis impossible to evaluate. We identify tissues in vivo and in vitro that curl when a free surface is created and use epithelial curling as a model phenomenon to investigate active torques.