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**Mechanical Feedback in the *Drosophila melanogaster* Embryo: Robustness and Intercellular Coordination** MICHAEL HOLCOMB, TTU, GUO-JIE GAO, Shizudai, JEFFREY THOMAS, TTUHSC, JERZY BLAWZDZIEWICZ, TTU — Successful embryonic development hinges on morphogenetic processes working in concert and requires both cellular coordination and the ability to continue development in spite of perturbations. We believe that this coordination and robustness are largely accomplished through intricate intercellular communication via mechanical stress fields and associated feedback mechanisms. The importance of chemical signaling to biological development is undeniable; however, mechanical stress has been shown to play an important role in tissue development. Systematic methods of studying the harmonization of cellular activities through mechanical stress and feedback within a tissue have yet to be developed. Motivated by the need for such methods, we introduce two novel modeling platforms which capture different aspects of ventral furrow formation (VFF), the initiating morphogenetic process of gastrulation in the Drosophila embryo. Both platforms represent cells as mechanically excitable objects which experience pairwise interactions; however, the first considers cells to be fully three dimensional, soft, non-spherical objects while the second hones in on the outer surface by simplifying cells into discs. Using these models, we explore how mechanical feedback can facilitate the robustness of VFF.

Michael Holcomb
TTU

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