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**Mechanical analysis of a heat-shock induced developmental defect**

SARAH M. CREWS, W. TYLER MCCLEERY, M. SHANE HUTSON, Vanderbilt University — Embryonic development in *Drosophila* is a complex process involving coordinated movements of mechanically interacting tissues. Perturbing this system with a transient heat shock can result in a number of developmental defects. In particular, a heat shock applied during the earliest morphogenetic movements of gastrulation can lead to apparent recovery, but then subsequent morphogenetic failure 5-6 hours later during germ band retraction. The process of germ band retraction requires an intact amnioserosa – a single layered extra-embryonic epithelial tissue – and heat shock at gastrulation can induce the later opening of holes in the amnioserosa. These holes are highly correlated with failures of germ band retraction. These holes could be caused by a combination of mechanical weakness in the amnioserosa or local increases in mechanical stress. Here, we assess the role of mechanical stress using confocal imaging to compare cell and tissue morphology in the amnioserosa of normal and heat-shocked embryos and laser hole drilling to map the stress field around the times and locations at which heat-shock induced holes open.

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