Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Probing the Forces of Germband Retraction with Laser-Microsurgery[1] HOLLEY LYNCH, Vanderbilt University, BRETT ROSENTHAL, Duke University, ELLIOTT KIM, ROBERT GISH, M. SHANE HUTSON, Vanderbilt University — Germband retraction is a stage of fruit fly embryogenesis that involves the coordinated movement of two tissues: the germband (GB), which uncurls while its cells elongate, and the amnioserosa (AS), whose cells shorten their long axis. To determine the mechanical causes of GB retraction, we conducted three series of laser ablations. First, we made linear incisions in the GB. We find an anisotropy in the maximum wound expansion consistent with a tensile force generated by the AS and applied to segments located around the curve of the GB. Second, we separated a patch of cells from the rest of the GB. These isolated cells do not continue to elongate, but instead round up. Even so, they often continue moving in the same direction. Third, we ablated part of one side of the saddle-shaped AS. Cuts destroying the AS cells closest to the curve of the GB halt GB retraction. Other AS cuts slow it. Our results indicate that the AS plays a mechanical role in GB retraction by applying tensile force to the curve of the GB.

[1]This work supported by the National Science Foundation.

Holley Lynch
Vanderbilt University

Date submitted: 20 Nov 2009 Electronic form version 1.4