

Modeling cell intercalation during germ-band extension of *Drosophila* embryo

James Feng*

james.feng@ubc.ca

During the development of the fruit fly embryo, an epithelial tissue known as the germ-band elongates along the body axis while shrinking in the transverse direction. This is largely due to the “intercalation” of cells, i.e., the interdigitation of neighboring rows of cells into each other. I will describe a chemo-mechanical model that accounts for the key features of the process: (a) the polarized spatial distribution of several signaling proteins and the myosin motor, (b) the anisotropic contraction force on cell borders, and finally (c) cell movement and neighbor-swap that realize intercalation. Through numerical computation, we investigate the mechanisms underlying the above episodes. The results compare well with experimental observations, and resolve several questions raised by them.

*Department of Mathematics and Department of Chemical and Biological Engineering, The University of British Columbia, 1984 Mathematics Road, Vancouver, BC V6T 1Z2, CANADA.