

Mechanical forces study during morphogenesis in *Drosophila Melanogaster*

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Abstract

Dorsal closure is the major morphogenetic event of the second half of *Drosophila* embryogenesis. At mid embryogenesis, the germ band of the embryo retracts, leaving a dorsal hole in the epidermis. This hole is covered by the amnioserosa, an extra-embryonic tissue that will be removed. In order for the epidermis to be continuous, the left and right dorsal epidermis merge dorsally during the process of Dorsal Closure.

The forces that drive tissue movements during Dorsal Closure have been analyzed in great detail. Three forces were described: First, the purse string effect of an actomyosin cable in the dorsalmost cells of the epidermis. Second, the pulling from the amnioserosa on the epidermis. Third, the adhesion of the filopodia present on the leading edge. A fourth force was described recently, the apoptotic force. Ten percents of the amnioserosa cells extrude basally during a process called delamination. These cells exert forces on their neighbors that in turn generate reaction forces. These reaction forces account for 50 percents of the closure efficiency. The way these particular cells act on Dorsal Closure is still not understood.