

A phase field model for soma-germline interactions in *Drosophila* oogenesis

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We study the signals mediating the mechanical interaction between somatic epithelial cells and the germline of *Drosophila*. We discover that, during the development of the egg chamber, the transcriptional regulator "Eyes absent" (Eya) modulates the affinity of the apical surface of epithelial cells to the nurse cells and the oocyte in the egg chamber. Using a phase field model, we develop a quantitative, mechanical description of epithelial cell behavior and demonstrate that the spatio-temporal expression of Eya controls the epithelial cells' shape and movement during all phases of *Drosophila* oogenesis to establish a suitable match between epithelial cells and germline cells. Further we show that differential expression of Eya in follicle cells also controls oocyte growth via cell-cell affinity.