



Life Sciences Seminar

An integrin-mediated adhesion between embryonic tissue and vitelline membrane affects gastrulation of insects

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Gastrulation is a critical step during the development of multicellular organisms in which a single-layered tissue folds into a multi-layered germband. This shape change is characterized by tissue folding and large-scale tissue flow. The myosin-dependent forces that underlie this process have been increasingly investigated; however, thus far, the possible interaction between the moving tissue and the rigid shell surrounding the embryo has been neglected. In this talk, I will present our quantitative findings on the physical mechanisms governing gastrulation in the red flour beetle (*Tribolium castaneum*). We investigated the forces expected within the tissue given the myosin distribution observed by multi-view light-sheet microscopy and discovered that an additional external force must be counteracting this tissue-intrinsic contractility. We then identified that a specific part of the tissue tightly adheres to the outer rigid shell. This attachment is mediated by a specific integrin (Inflated) whose knock-down leads to a complete loss of the counter-force. Moreover, in the fruit fly (*Drosophila melanogaster*) knock-down of another integrin (Scab) leads to a severe twist of the germband, suggesting that the integrin-mediated interaction between tissue and vitelline envelope may be an important mechanism that contributes a thus far unknown force to gastrulation movements in insects in general.

Friday, July 19, 2019 03:00pm - 04:30pm

Mondi Seminar Room 2, Central Building



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