



Life Sciences Seminar

Measuring the physical properties of individual muscle precursor cells

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Host: Carl-Philipp Heisenberg

Positions of the somite borders are determined in the presomitic mesoderm (PSM). Within the PSM, future somitic cells undergo significant changes in both morphology and position. How such large-scale cellular changes are coordinated and the resulting effect on future border formation is unknown.

In zebrafish embryos, we find that cellular rearrangements differ between cell populations within the PSM. In contrast to lateral somitic cells, which display less organized rearrangement, the adaxial cell layer undergoes significant tissue shearing. This shear is generated by orientated intercalations of dorsally and ventrally located adaxial cells, which induces a chevron-like border pattern in the adaxial cell layer. We find that Shh signalling is required for this observed tissue shear, revealing a novel role for Shh in regulating cell mechanics in the PSM.

To further investigate Shh regulation of cell mechanics, we are attempting to measure the physical properties of single adaxial cells and lateral somitic cells in wild type and in the Shh signaling inhibition condition. We hypothesize that Shh-dependent polarized recruitment of non-muscle myosin IIA increases the cortical tension of the apical surface of the adaxial cells, driving apical constrictions and thus the intercalations and shear.

Thursday, December 5, 2019 03:00pm - 04:15pm

IST Austria Campus Meeting room 2nd floor / Bertalanffy Bldg. (I04.2OG - LAB)



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