Presenter: Rachel Piselli

Authors: RACHEL PISELLI 1, Benoit Biteau 2

Title: Sox100B & Smooth Muscle Morphogenesis in Drosophila

Abstract

Organogenesis requires dynamic cell amplification, growth, and migration of transient progenitors from different developmental origins but with the potential to contribute to the same adult tissues. Tissue patterning, shape, and growth defects arise when key morphogenic events become uncoordinated with fate decisions during early differentiation, but the conserved and precise transcriptional regulators restricting fate commitment of many lineages still remain elusive. Understanding of lineage decisions has advanced significantly by capturing the dynamic role of transcription factors and the regulation of their target genes. Here, we have fate mapped previously uncharacterized multipotent progenitors originating outside the early larval Drosophila melanogaster ovary, which gives rise to part of the adult visceral muscle. Interestingly, we found that the dynamic activity of an enhancer responsive to the Sox E transcription factor Sox100B identifies multiple lineages in the developing ovary. In the visceral smooth-like muscle lineage, the activity of this enhancer abruptly ceases in progenitors prior their expansion and integration with cells programmed for a similar muscle fate. In parallel, cells that retain Sox100B transcriptional activity undergo endoreplication and cell growth and are ultimately eliminated by developmentally programmed cell death during metamorphosis. Functionally, our data suggest that Sox100B function in early common progenitor is required for normal ovarian development, with restricted muscle expansion and ovary growth in the adult when Sox100B expression is absent or diminished. We will further interrogate the role of Sox100B during the early fate decisions of smooth muscle by testing if differentiation is altered in the adult when the expression of Sox100B is restricted with sustained in this lineage during morphogenesis. Taken together, our data reveal the contribution of cells with a previously unknown fate giving rise to visceral muscle and highlight the complex function of Sox100B during fate commitment and morphogenesis in the developing fly ovary.