BDRC Seminar Series: “The role of ECM remodelling in tissue growth dynamics.”

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Keywords

Proliferation kinetics, cell-mechanics, ECM, *Drosophila*

During development, multicellular organisms undergo stereotypical patterns of tissue growth in space and time, but how this is orchestrated remains unclear. Using live-imaging and recent advances in analytical tools that capture cell and tissue deformations, we have quantified the growth kinetics of *Drosophila* histoblasts, a small population of progenitor cells that expand to form the adult abdominal epidermis. This has revealed key transitions important for defining the final size of the tissue. Through quantifying tissue mechanics through laser ablations we have revealed that ECM remodeling orchestrates the early transitions to trigger tissue expansion. Furthermore, ECM remodeling is also important for redistributing strain within an epithelium, a mechanism which could alter stress transmission and cell cohesiveness during morphogenesis.

Bio-sketch

John Robert did his PhD in the lab of Professor Brian Stramer at the Randall Division (KCL), where he examined the role of cell repulsion during *Drosophila* embryonic development with a population of macrophage-like cells called hemocytes. This work showed that through inter-cellular stress transmission, cell repulsion events where highly choreographed events allowing hemocytes to form an even dispersal pattern important for the proper deposition of ECM. For his post-doc he joined the lab of Dr Nic Tapon at the Francis Crick Institute, and initially studied the role of forces in regulating tissue growth of *Drosophila* histoblasts, which revealed the importance of ECM remodeling in initiating growth. In 2016 he was awarded a Sir Henry Welcome fellowship and changed his focus to examine how forces are balanced within cells and tissues, and the factors which regulate this.