



Life Sciences Seminar

From genetics to system, and back: A systematic exploration of neuronal remodeling

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Host: Simon Hippenmeyer

In our laboratory, we study the molecular mechanisms that regulate, control and execute developmental neuronal remodeling in *Drosophila melanogaster*. Remodeling refines neural circuits by a combination of degenerative processes, such as axon and synapse pruning, as well as regenerative processes, such as regrowth to form adult specific connections. Neuronal remodeling is essential for sculpting the mature nervous systems of both vertebrates and invertebrates during development. Despite its fundamental role in neurodevelopment and proposed contribution to various neuropsychiatric disorders, the mechanisms instructing remodeling are only partially known. The stereotypical remodeling of the *Drosophila* mushroom body (MB) during metamorphosis provides a unique system to genetically dissect neuronal remodeling. Here, we uncover the fine temporal transcriptional landscape of MB neurons throughout their remodeling phase. To enrich and complement this developmental expression atlas, we also sequenced developing neurons perturbed for three key transcription factors known to regulate pruning. Together, these datasets allowed us to construct the developmental and temporal framework of transcriptional modules that together drive remodeling. Moreover, we identified 10 DNA binding proteins that are involved in various aspects of remodeling, and describe their hierarchical relationships. Overall, this study provides the first broad and detailed molecular insight into the complex regulatory dynamics of developmental neuronal remodeling.

Tuesday, April 17, 2018 01:30pm - 02:30pm

Seminar Room, Lab Building East



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