IBI SEMINAR

“Gene Regulation during the Development of Drosophila CNS Midline Cells”

EPFL – room SV1717a

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Abstract

Midline cells of Drosophila are centrally located within the embryonic nervous system and they signal to and organize axons using similar signaling molecules, in a manner analogous to floor plate cells within the spinal cord of vertebrates. Because of its simplicity, the fly midline is an excellent model for studying axon guidance as well as transcription factors and signaling pathways involved in nervous system development. By the end of embryogenesis, the mature Drosophila midline consists of a small number of glia and neurons per segment: two glial and six neural subtypes. To understand how midline cells with different functions are generated during development, we study how genes are regulated within these cells. The midline is particularly valuable for these studies because the expression pattern of approximately 300 genes has been characterized within the different cell types. In addition, over one thousand enhancers that drive expression in specific midline subtypes have recently been identified. Dissection of a subset of midline enhancers has led to the identification of common motifs that bind transcription factors to activate or repress transcription in these cells. In addition, motifs consisting of simple sequence repeats specific to midline genes have also been identified and their function is under investigation. These experiments address how specific cells form and the central nervous system is constructed during development.

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