Molecular Mechanisms that Regulate Navigation Neurons in *Drosophila melanogaster*

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The human brain is composed of billions of neurons of diverse types performing a multitude of behaviors. All these cell types are produced from neural stem cells (NSCs) in a sequential manner. Any defects lead to various neurodevelopmental disorders such as schizophrenia, autism and microcephaly. An interesting question is what developmental programs regulate neural cell type formation and function.

Drosophila is an excellent model system to address these questions due to its genetic accessibility. NSCs are tractable and are similar to the mammalian systems and there is high gene conservation. There are structures where these factors can be tracked and followed throughout developmental days. Neural precursors generate specific cell types at specific times. In drosophila, Type II NSCs produce diverse populations of neurons that populate the adult central complex which is a conserved neuropil structure involved in higher-order brain functions. Our lab has recently identified a set of genes expressed in NSCs. 65CO3 in Drosophila is a gene marker that has a role in navigation and sleep behaviors, but its cellular and molecular programs regulating fate specification is still poorly understood. Here our aim is to investigate the roles of these temporally expressed genes in neural fate specification and function. We have identified a population of neurons that are known as dorsal fan shaped neurons involved in navigation and sleep.