GDCB Seminar

4:10-5 p.m. Tuesday, Feb. 23, 2021

"Modeling neural development and disease in zebrafish"

Abstract: Proper growth of the rapidly developing embryonic brain requires a balance of neural progenitor proliferation and cell fate specification, but the mechanisms coordinating these critical yet seemingly contrary processes are largely unknown. A more complete understanding of neural progenitor regulation is necessary to identify novel targets to treat malignant brain tumors, or harnessed to stimulate regeneration after brain injury or neurodegenerative disease. To address this the McGrail lab models neural development and disease in zebrafish using a combination of developmental genetics, functional genomics, and state-of-the-art CRISPR gene editing. Our studies revealed malignant brain cancer is driven by a neural progenitor transcriptional network that promotes tumor cell survival and cell cycle progression. This work indicates the histone chaperone RPPB4 and cell cycle regulator FoxM1 are attractive targets for combinatorial therapeutics in RB and TP53 mutant brain cancer. A second major area of research in the lab addresses a significant limitation in zebrafish genetic analyses due to mutant pleiotropy and a lack of cell type specific tools for gene inactivation. Our transformative CRISPR/Cas knockin technology has allowed us to isolate Cre/lox conditional alleles with robust spatial and temporal control. Additional innovative strategies using CRISPR targeted integration to manipulate gene activity and model neural development and degeneration will be presented.

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Join meeting:

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