

Models of Congenital Malformation and Disease

Faculty Search Seminar



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Uncovering mechanisms of tumour progression using translational zebrafish models of paediatric cancer

Sarcomas belong to a heterogeneous group of tumors that affect connective, supporting, or soft tissue of mesenchymal origin. Over 15% of pediatric cancers are sarcomas and despite intensive treatments, children with relapsed or metastatic disease still experience devastatingly high rates of mortality. It is now well known that the microenvironment plays a major role during tumor progression; however, specific interactions within the tumor microenvironment and how these interactions affect tumor biology across human cancers are not very well understood. Zebrafish provide many exciting opportunities for the study of human cancer in an intact animal system. Short tumor latency and the amenability of zebrafish for live imaging studies and tumor cell transplantation have allowed for efficient study of sarcoma initiation, growth, self-renewal, and maintenance. Using a zebrafish model of rhabdomyosarcoma (RMS), I uncovered important roles for developmental signaling pathways in tumor relapse and effectively translated my findings to human using cell culture and xenograft transplantation approaches. Specifically, I found that Van Gogh-like 2 (Vangl2), a core regulator of the Wnt/PCP signaling pathway, is required for growth of human RMS and enhances the self-renewal properties of zebrafish RMS *in vivo*. Furthermore, I found that *vangl2* expression labels RMS stem cells *in vivo*, revealing a useful molecular marker for future cell tracking experiments in the future. Using this model and others, I aim to harness the unique advantages of zebrafish cancer modeling and translate our discoveries to human to understand mechanisms of progression and inform novel therapeutic strategies for future use in the clinic.

Wednesday | February 12th | 2020 | 3 pm

PGCRL Auditorium

Hosts: Drs. Brian Ciruna & John Brumell

Dr. Madeline Hayes is being interviewed for a Scientist position at the Research Institute