

Department of Molecular and Cellular Biology  
**Graduate Seminar MCB\*6500**  
Friday, Sept. 28, 2018 in SSC 1511 @ 12 noon

*presented by:*

## **Victoria Rea**

*(Advisor: T. Van Raay)*

### **“Effect of gut microbiome metabolites on neural development and behaviour”**

Colonization of the human gut microbiota begins before birth and continues through adulthood where the gut microbiota collectively consists of trillions of microbial cells. Studies have shown that the gut microbiota is required for proper organ development and an absence of microorganisms causes significant developmental deficits to their host. There is a strong correlation between the gut and the central nervous system as development of the nervous system coincides with colonization of the microbiota. Preliminary evidence has shown that the microbiota produce metabolites that may influence nervous system function however previous studies have focused on the effect of gut microorganisms post nervous system development. Here, I propose to use zebrafish (*Danio rerio*) as an *in vivo* model to analyze the effects of gut microbiome metabolites on the very first stages of neurogenesis. I hypothesize that gut microbiome metabolites influence the development of the nervous system. To test this hypothesis I will compare differences between conventionally raised zebrafish, germ-free zebrafish and germ-free zebrafish that have been reintroduced to healthy human fecal metabolites. Firstly, I will compare changes in neural development and patterning genes by whole mount *in situ* hybridization and real-time quantitative PCR. I will then compare differences in whole embryo respiration. Lastly, I will look for differences in cognitive behaviour by conducting widely used behavioural tests. Understanding the effect of gut microbiome metabolites on neural development will provide more insight on how the microbiota contribute to host health and physiology.