

Department of Molecular and Cellular Biology
Graduate Seminar MCB*7500

Friday, April 9, 2021 @12 p.m.

presented by:

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“Using chemostat bioreactors to investigate the gut microbiome in adolescents with pre-type 2 diabetes”

Type 2 diabetes (T2D) currently affects hundreds of millions of people globally with disease rates continuing to rise. To address this, a more comprehensive understanding of risk factors leading to the disease needs to be understood. Unhealthy diet is a significant risk factor in the development of T2D and can impact the ecosystem of microorganisms that inhabit the gut, termed the gut microbiome. Recent research has explored the connection between the gut microbiome and T2D finding that the overall function of this community of microbes has a reduced capacity to produce short-chain fatty acids, which in turn has been linked to chronic inflammation that can worsen T2D. Most of the research in this field currently has focused on adults with T2D, but this disease is a growing concern for adolescents. For this research, stool from adolescents with pre-T2D will be used to culture the microbial communities in the ‘Robogut’ bioreactor system. This ‘Robogut’ is designed to replicate the conditions found in the human colon and allows for the study of the microbial community in isolation from the host, for example through compositional analysis of the ecosystem using metagenomics and functional analysis of the metabonome using 1-dimensional proton nuclear magnetic resonance. Individual microbial species can be isolated from microbial ecosystems grown in this way, and used to derive a complex but defined and reproducible community. The aim of this research is to explore the gut microbiomes of adolescents at risk of developing T2D and to establish reproducible model ecosystems representing the adolescent pre-T2D gut microbiome.