Faculty of Engineering and Applied Science
Chemical Engineering Seminar Series

Dynamic Control of Metabolism

Dr. Radhakrishnan Mahadevan /University of Toronto

Thursday, April 07, 2022, 2:30pm

Dupuis Hall, Room 215

Bio-processes are required for the sustainable production of energy and materials. Advanced modeling, simulation and control tools are required to accelerate the development of such bioprocess. Genome based metabolic modeling enables a systematic approach to engineering metabolism for the production of chemicals and fuels. However in order to truly leverage the potential of biotechnology, methods to implement dynamic control of metabolism are required. Specifically, methods to allow the switch between a growth mode and a production mode is required to enhance bioprocess productivity. In the first part of the talk, methods for identifying metabolic valves will be presented. Next, the model based design of fast genetic toggle switches will be discussed. Finally, we will also present design principles for flux sensing that enable the use of enzymatic regulation for dynamic control of metabolism.