BIOENGINEERING & BIMEDICAL ENGINEERING
RESEARCH SEMINAR

IMPROVING SUSTAINABILITY OF WASTEWATER TREATMENT WITH PSYCHROPHILIC ANAEROBIC DIGESTION OF WASTE ACTIVATED SLUDGE: HOLY GRAIL QUEST OR PIPE DREAM?

Dr. Dominic Frigon
Department of Civil Engineering
McGill University

Prof. Frigon is an Associate Professor in the Department of Civil Engineering at McGill University (Montreal, Canada). He holds B.Sc. and M.Sc. degrees in Microbiology from McGill University (Canada) and a Ph.D. in Environmental Engineering from the University of Illinois at Urbana-Champaign (USA). He is specialized in biological wastewater treatment, organic resource recovery, and biosolids safety, with emphasis on the characterization of microbial communities with metagenomics and mathematical modeling. He directs a team of several Masters and Ph.D. students currently working on innovative systems for producing of biomaterials and energy from waste, the dynamics of antimicrobial resistance and virulence genes, the reduction and sanitation of excess biosolids, and the impact of influent biomass on microbial activities inside wastewater resource recovery facilities.

In Québec, landfilling and incineration of waste activated sludge (WAS) and other municipal organic waste will be banned by 2022. Similar efforts to recover energy and reduce greenhouse emissions are underway throughout Canada. Consequently, there is a renewed interest in building anaerobic digesters for organic waste, and in optimizing the benefits of the process. The goals of this study was to increase the energy recovery from anaerobic digestion of WAS, while reducing the amount of organic waste to handle. In this study, we are finding ways to boost the transformation using possibly direct interspecies hydrogen transfer. Through optimization and community engineering, we foresee a possible anaerobic digestion process that would not require heating even during the cold winter months.

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McGill
Department of Biomedical Engineering
Department of Bioengineering

Dr. Christine Tardif (christine.tardif@mcgill.ca)
Dr. Sebastian Wachsmann Hogiu (sebastian.wachsmannhogiu@mcgill.ca)