



**Science Outreach – Athabasca
presents...**

Bioconversion of Methane to Biodegradable Plastic



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Date: Tuesday, February 22, 2022

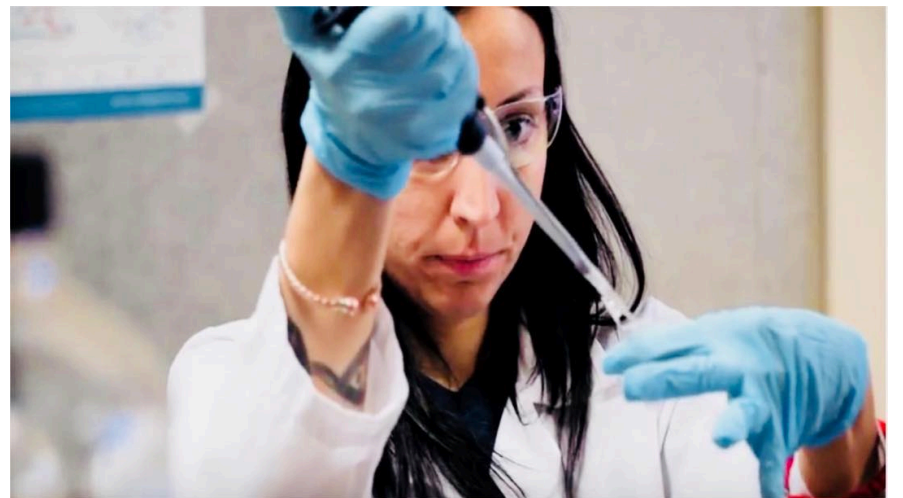
Time: 7 PM

Please join the virtual session below:

<https://us06web.zoom.us/j/7973894998?pwd=RFZINXlzNXV3ZmQ4dGJhbVVTRWttUT09>

Meeting ID: 797 389 4998 Passcode: 8zz14R

Methane represents carbon and energy source for a group of bacteria known as methanotrophs. Methanotrophs convert methane into cellular components that drive biochemical processes during active bacterial metabolism. In this project, the focus of interest is metabolite called polyhydroxybutyrate (PHB). This compound is precursor for production of biodegradable plastic (bioplastic). In an ideal scenario, methanotrophs would acquire methane, harmful greenhouse gas released by human industrial activities, and reduce not only the levels of global warming contributing compound, but also the amount of plastic waste released to the environment. However, the amount of biodegradable plastic produced from methane has not been large enough to compete with the amount and cost of commercial, petroleum-based plastic. Thus, we aimed to improve the “green plastic” approach using methanotroph called *Methylocystis* sp. Rockwell. Our goal is to detect the “sweet spot” growing conditions that will result in the highest bacterial biomass followed by the highest PHB production. This strategy has the potential to develop into a platform for production of environmentally friendly biodegradable plastic. In addition, we are working on developing novel, environmentally friendly approach for detection of this molecule, PHB. Current approach is time consuming and involves the usage of toxic solvents. The approach that we are developing involves synthetic biology and genetic engineering (part 1) and electron microscopy (part 2). At the end, we hope that we will be able to do both, optimize PHB production from methane and develop environmentally friendly approach for its detection. Free community event!



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