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## **In silico generation and analysis of “green” mono-ethylene glycol synthesis routes from synthesis gas [Abstract]**

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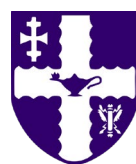
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## **Title: In Silico Generation and Analysis of “Green” Mono-Ethylene Glycol Synthesis Routes from Synthesis Gas**

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### **Abstract**

Mono-ethylene glycol (MEG) is an important platform chemical with widespread use in numerous consumer products. The current industrial MEG-production process relies on non-renewable fossil fuel-based feedstocks, such as petroleum, natural gas, and naphtha; hence, it is useful to explore alternative routes of MEG-synthesis from gases as they might provide a greener and more sustainable alternative to the current production methods. Technologies of synthetic biology and metabolic engineering of microorganisms can be deployed for the expression of new biochemical pathways for MEG-synthesis from gases, provided that such promising alternative routes are first identified. In this talk, I'll discuss how a computational algorithm called BNICE.ch have been used to develop novel and previously unknown biological pathways to MEG from synthesis gas by leveraging the Wood-Ljungdahl pathway of carbon fixation of acetogenic bacteria. I'll also focus on how we developed a set of useful pathway pruning and analysis criteria to systematically assess thousands of pathways generated by BNICE.ch. These analyses helped identify not only better candidate pathways but also superior chassis organisms that can be used for metabolic engineering of the candidate pathways. The pathway generation, pruning, and detailed analysis procedures described in this talk can also be used to develop biochemical pathways for other commodity chemicals from gaseous substrates.

### **Biography**

Dr. Ahsan Islam obtained his PhD in Chemical Engineering and Applied Chemistry with specialization in Genome Biology and Bioinformatics from the University of Toronto in 2014. He was a postdoctoral scholar in the Department of Chemical Engineering at the Massachusetts Institute of Technology from 2014 to 2017. Since July 2017, he has been working as a Lecturer in Bio/Chemical Engineering in the Department of Chemical Engineering at Loughborough University. His research interests lie in the areas of systems and synthetic biology, metabolic engineering, computational biology, and bioinformatics.