

Membrane bioreactors for the production of value-added products from urban waste streams

Background: Biofilm-membrane hybrid systems offer potential as platform technologies for the production of value-added products such as biopolymers and organic acids from urban waste streams (e.g., municipal wastewater, food processing waste streams). Despite the promising results at laboratory scale, industrial deployment is hindered due to challenges associated with scale-up. This thesis will produce a critical review to address these challenges and create a framework to assess industrial application of membrane bioreactors to produce value-added products from urban waste streams. Focus will be placed on the current state-of-the-art of biofilm-membrane hybrid systems to increase the mass transfer rate of the limiting substrates, reach high cell concentrations and separate the inhibitory substances that may inhibit the bioconversion reaction.

Following aspects should be included in the thesis:

- Identification of potential precursor of value-added products in urban waste streams (e.g., particulate matter, volatile fatty acids, biopolymers)
- Current and next-generation bioreactor processes and configurations for valorization of value-added products from urban waste streams
- Techno-economic analysis of identified value-added products from urban waste streams

Specific information and requirements: Candidates are expected to have a background in microbiology, biochemistry and/or environmental engineering. Candidates with extramural research experience are highly favored. An openness to work with scientists of different disciplinary backgrounds is essential.

Duration: depending on program

Start date: Immediate

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