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Heat-Transfer Method (HTM) for the real-time detection of bacteria from wastewater samples and prevents bacterial contamination using drugs and other alternatives

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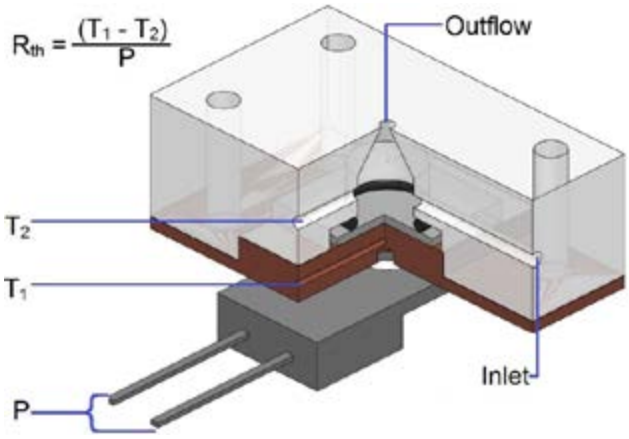
In previous work, the Heat-Transfer Method (HTM) was used to study the viability of yeast cells (*Saccharomyces cerevisiae*), proving the ease in sample handling, the straightforward data interpretation, and cost effectiveness of thermal sensing. In this work, we will explore the use of the Heat-Transfer Method (HTM) for the real-time detection of bacteria from wastewater samples. The complexity of the samples is shown by characterizing up to six different bacterial species in samples, all exhibiting different growth characteristics, and they were divided into gram positive and negative species. The thermal responses of gold electrodes upon exposure to strongly diluted samples of bacteria was monitored, and showed an increase in thermal resistance at the solid-liquid interface with increasing concentrations of the bacteria. Specially designed flow cells were synthesized using 3D printing to facilitate longitudinal experiments. Lastly, the HTM will be used to study the effect of different bactericidal components such as antibiotics, disinfectants and UV treatment, which will determine how we can optimize wastewater treatment and prevent bacterial contamination. With this new application of the HTM, we have shown the real-time growth of bacteria and determined aspects (temperature, nutrients, and pH) that influence the growth. The method can easily be adapted for further study of other microorganisms and in particular to study the response of bacteria to selected antibiotics. Currently, we are determining and optimizing conditions facilitating the removal of bacteria from wastewater samples.



Biography

Amanpreet Kaur did Masters in Chemistry from Thapar University, Patiala (India). Afterwards, she was selected in DST-SERB (Department of Science Technology- Science Engineering Research Board funded research project at Guru Nanak Dev University, Amritsar (India) and worked there for 2.5 years for the detection of heavy metals. Currently she is working in a Research project on the detection of Bacteria at Manchester Metropolitan University, U.K under the supervision of Dr. Marloes Peeters.

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