GRADUATE STUDENT RESEARCH SEMINAR SERIES (2018)

DEVELOPMENT OF A STREAMING DIELECTROPHORESIS NUMBER TO DESCRIBE A SYSTEM FOR CONTINUOUS PARTICLE SEPARATION

SPEAKER: RUCHA NATU

Here we present results towards the development of a streaming Dielectrophoresis (DEP) number to describe a system for continuous particle separation. In Streaming DEP, targeted cells are not trapped but continuously focused into parallel streams for easy retrieval. This focusing depends on the equilibrium between the DEP and drag forces acting on the particle. Since the DEP force depends on the membrane capacitance and the particle size, streaming DEP is advantageous over the use of other label-free techniques, such as acoustophoresis, inertial microfluidics and deterministic lateral displacement, because cells can be isolated not only based on size but also based on viability, age and fate potential. Our work uses fluid flow enabling high flow rates and use of 3D carbon electrodes enables use of lower voltages than the case of insulator posts. In our previous work we used numerical simulations to determine stream widths continuous cell sorting of human neural progenitor cells. This work characterizes the stream widths obtained with change in different voltage and flow parameters and is the first step towards developing a streaming DEP number based on the particle, fluid, electrode and voltage parameters to determine the streaming regimes and widths for separation.

MONDAY, APRIL 4 3:00 PM

EIB 132