Department of Physics and Materials Science

SEMINAR

Acoustic Bubble: A Promising Tool
for Biomedical Lab-on-a-Chip Applications

Dr. Yuan Gao
Dept. of Mechanical Engineering
The University of Memphis

Abstract: A typical biomedical analysis process usually requires (1) multiple steps such as sample collection, sample preparation and analytes detection; (2) sophisticated equipment; and (3) professional personnel. All these weaknesses have become a burden to ever-increasing demands of rapid and reliable healthcare for individuals and society. In recent years, microfluidics has shown great potential to become a go-to solution, by which most of these steps can be realized in a single miniaturized device. Especially, by combining acoustics and microfluidics, we can achieve contactless operation with high controllability and high biocompatibility, which is well poised for solving the challenges in various biomedical research related to healthcare.

In this talk, I will present acoustic bubbles (gas/air interfaces) in microfluidic systems for various biomedical applications to address the challenges in fluid transportation, cell manipulation and disease treatment. The versatile functions of acoustic bubbles will be discussed with experimental examples. This talk will also cover the approaches to building various microfluidic biomedical devices using advanced manufacturing technologies and low-cost materials. Building on my background in acoustic microfluidics, bioapplications, and advanced manufacturing technologies, I will share my current work and future research in the development of innovative acoustic microfluidic systems for various biomedical applications.

Bio: Yuan Gao is an assistant professor in the Department of Mechanical Engineering at the University of Memphis (UofM). She received her Ph.D. in Mechanical Engineering at the University of Illinois Chicago in 2022. The overarching goal of her research is to develop micro/nanofluidic systems for addressing the problems in biomedical research related to human health. Her research interests also span from building microrobots motion control for disease diagnosis and drug delivery, to the development of organ-on-a-chip platforms for in vitro physiological study and drug treatment. Her research has resulted in 10+ peer-reviewed journal articles, published in Lab on a Chip, Sensors & Actuators: B. Chemical, and Microfluidics and Nanofluidics and these research works have been supported by National Aeronautics and Space Administration (NASA), National Science Foundation (NSF), and Anthem, Inc.

YOU ARE INVITED!

Friday Sept. 30th, 3 - 4 PM Manning Hall 201

THE UNIVERSITY OF MEMPHIS

Driven by doing.