

CD Fluidics for Extreme Point of Care

Topic: CD Fluidics for Extreme Point of Care

Speaker: Prof. Marc Madou (University of California)

Venue: Room No. 102, LBC, IIT Bhubaneswar

Date: 11th Nov. 2019 (Monday)

Time: 5.45 P.M. to 6.45 P.M.

Abstract:

In this talk, we review the usefulness of centrifugal microfluidic technologies applied to point-of-care diagnosis in under-resourced or extreme environments. The various challenges faced in these extreme point-of-care (EPOC) settings are showcased, using areas in India and Africa as examples. Measures for point-of-care devices to effectively address these challenges are highlighted, and centrifugal or CD-based microfluidic technologies are presented as a promising solution to accomplish these criteria. We describe the advantages of centrifugal fluidic handling, as well as the ability of a standard CD player to perform several standard laboratory tests, fulfilling the role of an integrated lab-on-a-CD. Innovative centrifugal approaches for extreme point-of-care are highlighted, including sensing and detection strategies, smart power sources and biomimetic inspired solutions for environmental control. The evolution of centrifugal microfluidics, along with examples of commercial and advanced prototype centrifugal microfluidic systems, is presented, illustrating the success of deployment at the point-of-care. A close fit of emerging centrifugal systems to address a critical panel of tests for under-resourced clinic settings, formulated by medical experts, is demonstrated. This emphasizes the potential of centrifugal microfluidic technologies to be applied effectively to extreme point-of-care

scenarios and plays a role in improving primary care in resource-limited settings across the world.

Biography of the Speaker:

Before joining UCI as the Chancellor's Professor in Mechanical and Aerospace Engineering (MEA), Prof. Madou was Vice President of Advanced Technology at Nanogen in San Diego, California. He specializes in the application of miniaturization technology to chemical and biological problems (BIO-MEMS). He is the author of several books in this burgeoning field which is helpful both in Academia and in Industry. He founded several micromachining companies and has been on the board of many more. Many of his colleagues became well known in their own right in academia and through successful MEMS start-ups. Prof. Madou was the founder of the SRI International's Microsensor Department, founder and President of Teknekron Sensor Development Corporation (TSDC), Visiting Miller Professor at UC Berkeley and Endowed Chair at the Ohio State University (Professor in Chemistry and Materials Science and Engineering). The third edition of "Fundamentals of Microfabrication," an introduction to MEMS and NEMS, which has become known as the "bible" of micromachining. Some of Prof. Madou's current research work involves a compact disc-based fluidic platform and carbon MEMS, those two fields were pioneered by Prof. Madou. Prof. Madou is Visiting Professor at IIT Kharagpur, India; World Class University Scholar, UNIST, South-Korea; Icon Professor University of Malaya and Star Faculty at Monterrey Tecnológico.



