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Optofluidics: Photonic Technologies for Mobile and Global Health



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ABSTRACT:

Smartphones and other mobile technologies will be transformative to the deployment of molecular diagnostics both domestically and worldwide. In this talk, I will review the existing commercial and technical roadblocks to the deployment molecular diagnostics to the consumer market and how they can be fundamentally altered by taking advantage of the now ubiquitous installed base of smartphones. I will discuss two technologies in this talk. The first is our KS-Detect system which is a solar-powered PCR system currently targeted towards the diagnosis of Kaposi's sarcoma in sub-Saharan Africa. The second is our NutriPhone technology which is designed to detect micronutrient and vitamin deficiencies both in individuals and populations. In addition to covering the basic engineering science advancements that led to the development of these technologies, I will also discuss our strategies for deployment and commercialization.

BIOGRAPHY:

Prof. David Erickson is a Professor in the Sibley School of Mechanical and Aerospace Engineering at Cornell University. His research focuses on: mobile and global health technology, microfluidics, photonics, and nanotechnology. Prior to joining the faculty, he was a postdoctoral scholar at the California Institute of Technology and he received his Ph.D. degree from the University of Toronto. Research in the Erickson lab is primarily funded through grants from the NSF, NIH, ARPA-E, ONR, DOE and DARPA. Prof. Erickson has co-founded 3 companies commercializing smartphone enabled medical diagnostics, global health technologies, or high-throughput nanoparticle analysis instrumentation. In recent years, Dr. Erickson has received the DARPA-MTO Young Faculty Award, the NSF CAREER Award, and the Department of Energy Early Career Award. In 2011 he was awarded the Presidential Early Career Award for Scientist and Engineers (PECASE) by President Obama. For his efforts in co-founding the field of optofluidics, Erickson has been named a fellow of the Optical Society of America (OSA) and the American Society of Mechanical Engineers (ASME).