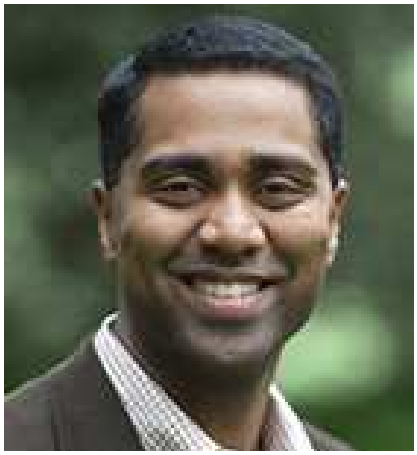
Mechanical Engineering Department Seminar

3:35pm March 2, 2016
1130 Mechanical Engineering
111 Church Street SE, Minneapolis, MN 55455

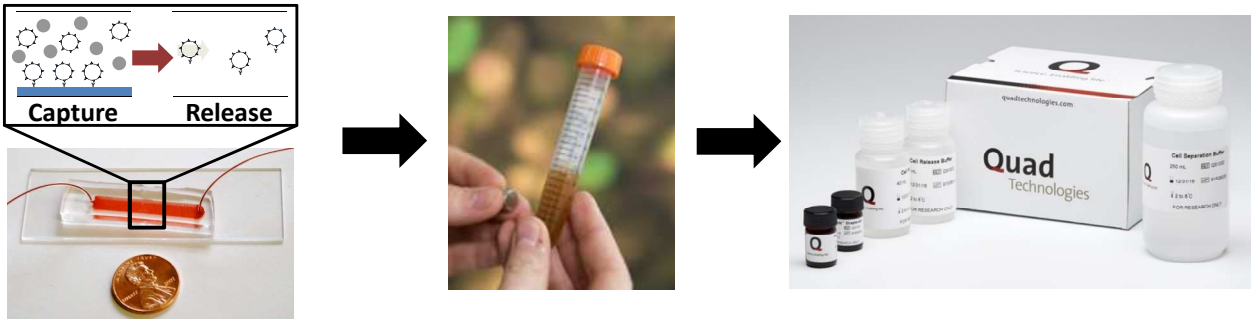


Hydrogels for Cell Purification: From Laboratory to Commercialization

Shashi K. Murthy

Professor; Northeastern University

Microfluidic channels with immobilized proteins and antibodies have been utilized for a wide range of applications, from clinical diagnostics to tissue engineering. This presentation will describe our work in the isolation of stem and progenitor cells for diagnostics and therapeutics from complex samples such as blood and digested tissue. A key element in our approach is the design of alginate hydrogel-based surface coatings that can be applied onto the surfaces of microfluidic channels. These hydrogels are functionalized with antibodies, enabling specific capture of target cells, but more importantly they also have the ability to release captured cells without loss of viability or function. The significance of this approach lies in the ability to isolate low abundance stem/progenitor cells without the need for labeling with fluorescent or magnetic tags, which significantly reduces the time required for their isolation relative to state-of-the art techniques and minimizes undesirable stimulation of these sensitive cells. Specific examples to be covered in the presentation will include endothelial progenitor cells from blood and skin stem cells. This presentation will also describe our group's experience in commercializing this separation technology which is now a product on the market.



Bio: Shashi Murthy is a Professor of Chemical Engineering and the Founding Director of the Michael J. and Ann Sherman Center for Engineering Entrepreneurship Education at Northeastern University. Prof. Murthy earned his Ph.D. in Materials Science & Engineering at the Massachusetts Institute of Technology (MIT) in 2003 and his B.S. in Chemical Engineering at Johns Hopkins University in 1999. He joined Northeastern in 2005 following a postdoctoral fellowship at the Harvard Medical School and Massachusetts General Hospital. Prof. Murthy holds visiting appointments at the Massachusetts General Hospital, Shriners Hospital for Children, and the Broad Institute of Harvard & MIT. He is the recipient of the National Science Foundation's Faculty Early Career Development (CAREER) Award and the Søren Buus Award for Outstanding Research in Engineering at Northeastern University. In 2016, he was elected Fellow of the American Institute for Medical and Biological Engineering (AIMBE). Prof. Murthy has co-authored over 70 publications and is an inventor on 7 issued or pending patents. He is also a founder of Quad Technologies Corp., which has brought to market a polymer hydrogel designed in his laboratory for applications in cell purification.