

Texas A&M University Nano/Micro Seminar Series Presents:

Magnetic Microsystems for Biological Separations

by A. Bruno Frazier
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Tuesday, November 17, 10 a.m. – 11 a.m.
Room 342 ZEC

Abstract

Over recent years, there has been a rapidly increasing interest in the development of microsystems for biological and biochemical analysis. Applications range from the general DNA and protein analysis to basic studies of cellular mechanisms such as neurodegeneration and tumor heterogeneity. The focus of this seminar will be on recent developments in microsystems technologies for cellular analyses from complex media. In particular, this presentation will include the development and demonstration of continuous flow microsystems for separation of biological materials based on magnetic forces generated on the micro and nano scale. Two force mechanisms, paramagnetic and diamagnetic forces, will be utilized as a means of collecting rare cells from complex samples such as blood and dissociated tissue. Additionally, multi-functional microsystems will be discussed that couple the magnetic separation systems with other integrated bioanalytical tools for downstream whole cell analysis. Applications of the technology range from conventional blood analysis such as blood cell counts, to the collection / identification of rare cells such as circulating tumor cells, to the quantification of cellular heterogeneity in tumor tissue.

Biography

A. Bruno Frazier received the B.S. and the M.S. degrees in electrical engineering from Auburn University in 1986 and 1987, respectively. From 1987 to 1990, he worked for Intergraph Corporation as a custom circuit designer and advanced packaging engineer. From 1990 through graduation in December 1993, Frazier was in the Ph.D. program at the Georgia Institute of Technology with an emphasis in microelectronics and specifically in micromachining technologies. From March 1994 - July 1995, he worked as a Visiting Scholar in the Department of Electrical Engineering and Computer Science at the University of Michigan. From August 1995 - August 1999, he held a joint tenure track faculty position as an assistant professor of bioengineering and electrical engineering at the University of Utah. From August 1999 to present, Frazier has been a faculty member in the School of Electrical & Computer Engineering at the Georgia Institute of Technology and is currently a professor and chairman of the ECE bioengineering technical interest group. His current research interests are the development of enabling microsystems for biomedical applications as well as the development of novel microfabrication methodologies. Many of the current research projects involve the development of microsystems for whole cell and molecular analysis from complex samples such as blood, tumor tissue and neuronal tissue. He has authored seven United States patents and 140+ peer reviewed manuscripts.

If you have a question regarding this seminar, please contact Arum Han, arum.han@ece.tamu.edu.

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