Mechanical Engineering **SEMINAR**

Microfluidic Devices for Clinical Diagnostics and Health Management

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The focus of research conducted in the Zahn laboratory is the design and fabrication of microfluidic technologies for the clinical diagnosis and treatment of disease. Batch fabricated microfluidic platforms that can mimic conventional sample preparation techniques performed in laboratories hold great potential to enable both research and healthcare advances. These miniaturized diagnostic devices have been termed micro total analysis systems (μTAS) or biochips and combine sensing mechanisms (physical, optical, electrical or chemical) with microfluidics. While microfluidics promises to have an impact in many research fields, one of the more attractive applications has been towards biomedical and life science diagnostics. There is a growing market for point of care diagnostic devices for both bedside and outpatient monitoring.

This seminar will provide an overview of research projects currently underway in the Zahn laboratory which utilize microfluidic technologies for the clinical diagnosis and treatment of disease. First, research on miniaturized hypodermic injection needles and an on-chip microdialysis system for continuous glucose monitoring for diabetes treatment will be discussed. Next, approaches towards developing devices which can separate blood plasma from whole blood and measure the concentration of the clinically relevant proteins in a continuous, real time fashion will be discussed. This is especially important for monitoring inflammatory responses in patients undergoing cardiac surgery when cardiopulmonary bypass (CPB) is used. Finally, an approach for improving DNA purification from cells using a two phase liquid extraction with electrohydrodynamic (EHD) instability micromixing is discussed

Jeffrey D. Zahn is an assistant professor of Biomedical Engineering at Rutgers, The State University of New Jersey. He received the Ph.D. degree from the Joint UCSF-UC Berkeley Graduate Group in Bioengineering in 2001. He graduated from the MIT in 1995, with a Bachelor of Science degree in Chemical Engineering and a minor in Biology.

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11:00 am Seminar in 227 Mudd

12:00 pm Lunch in ME Lobby