Master of Engineering and Undergraduate Research Projects for Integrated Micro-/Nanofluidic Devices Lab.

Below are the 2006-2007 Open Master of Engineering and Undergraduate research project for the Erickson lab at Cornell University. If interested please contact David Erickson at de54@cornell.edu or drop by 240 Upson Hall. Projects are appropriate for students in mechanical, biomedical, electrical or chemical engineering.

**Insect Cyborg Sentinels**

The overall goal of this project is the “intimate fusion” of nanofluidic devices with living, flying insect cyborgs (half insect/half micromachine). This is a cross campus project involving researchers from mechanical and electrical engineering, entomology and veterinary medicine.

Involvement in the project will be dependent on the interests of the student however could involve either (1) device nanofabrication (2) studies on biofouling of pupa stage implanted nano-fluidics (3) helping with drug delivery and injection studies.

**Optofluidic Cancer Screening**

In this project we are developing integrated microfluidic devices for high throughput cancer screening. The technique involves specific detection of cancer antigens in human sera using nanostructure surface plasmon resonance techniques. Uniquely both the device itself and the active optical components (*i.e.* lasers) are based entirely on microfluidic technology.

In this project the student will work with another Master of Engineering student to demonstrate specific detection of a target antigen from human sera samples. The experiments would involve operation (and perhaps design and development) of the device.

**Smart Fluids for Microfluidic Devices**

This project involves the exploitation of directed nano-assembly microfluidic components using nanoscale electrorheological fluids. These components have enormous potential as either a base for either reconfigurable fluidic devices or as active components in nanoscale fluid metering.

In this project the student will be responsible for the synthesis of the smart fluids and testing them in a microfluidic device.