

# SEMINAR:

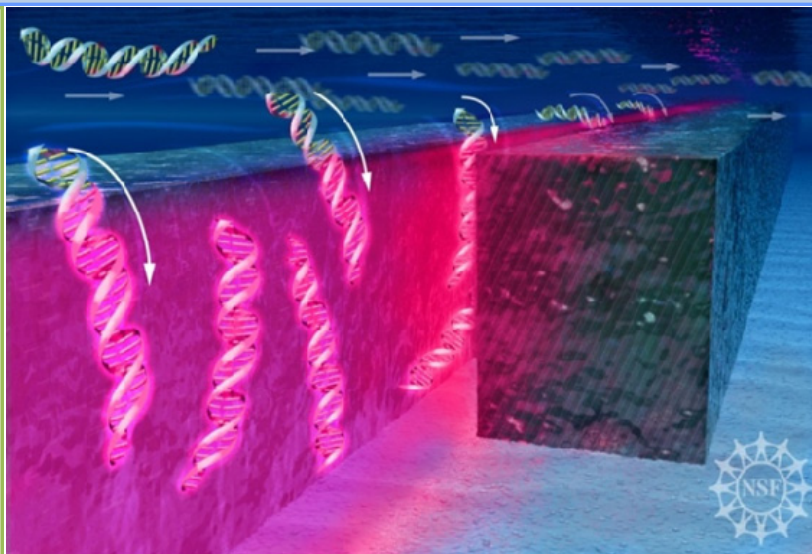
## Optofluidics: Directing light for nanoscale transport in fluidics

### Dr. Allen H.J. Yang

*Postdoctoral Associate*

*Institute for Collaborative Biotechnologies  
University of California Santa Barbara*

Dr. Yang's research interests focus on developing integrated force field microfluidic devices for biomedical diagnostics and high-throughput sample processing. He received his BS in Chemical Engineering from Carnegie Mellon University in 2005. Previous to joining the lab of Professor Hyongsok (Tom) Soh at UC Santa Barbara in 2010, Dr. Yang received his PhD in Chemical Engineering from Cornell University working under Professor David Erickson. In 2009, he served as a committee co-chair for the Cornell Engineering Research Conference. In 2010, he received an award for the best research presentation at the Chemical Engineering Graduate Symposium.



### Abstract

Optofluidics is a recently developed field of research focused on the integration of optical devices with microfluidics. This mutually beneficial fusion has been critical to new microscale technologies such as fluidically adaptable optics and low-mass detection optical biosensors. By exploiting the fundamental interactions of light with matter, it becomes possible to directly interface and manipulate objects within microfluidic chips using light. Here I will show how nanophotonic optical structures provide a means of generating and controlling high-intensity optical fields which can then be used to direct particles in a fluid. The integration of nanophotonics with microfluidics results in a new paradigm of optically driven transport that can operate at nanoscale dimensions. A key result of this research has been the demonstration of the all-optical trapping of single  $\lambda$ -DNA biomolecules. This talk will also discuss methods for enabling advanced particle control using resonant optical structures. The advancements made here are a first step towards bridging the gap between microfluidics and nanophotonics.

**Thursday**

**March 17, 2011**

2:00-3:00pm

Engineering 2 Building

Room #215



**Presented by the  
W. M. Keck Center for  
Nanoscale Optofluidics  
and the California Institute for  
Quantitative Biosciences (QB3)**

**Host: Dr. Philip Measor**