

Spring MRSEC Directors' Meeting
University of Washington, Seattle, WA, May 1 & 2, 2008,
Science Session –

1. Materials and Measurement Challenges in Personalized Medicine

Professor Lee Hartwell, Director, Fred Hutchinson Cancer Research Center, Seattle, WA, USA

The enormous impact that early detection of diseases, such as cancer, could have on saving lives is one of the most exciting research directions of our time. In this endeavor, two critical issues are: improving patient outcomes and reducing health care costs. Hartwell will discuss a fresh approach to the health care predicament with a collaborative model that engages health care professionals and researchers in the discovery, development, and validation of diagnostic biomarkers.

Professor Hartwell is the President and Director of Fred Hutchinson Cancer Research Center in Seattle and a professor in Genome Sciences, University of Washington. His scientific work focuses on personalized Medicine. He is the recipient of the Nobel Prize in Physiology or Medicine in 2001 on the discovery of the genes that control cell division-genes that turned out to be the universal machinery for cell growth in organisms from fungi to frogs to humans. Extended biographical sketch of Professor Hartwell could be found at: <http://www.fhcrc.org/research/nobel/hartwell/> and also at: http://nobelprize.org/nobel_prizes/medicine/laureates/2001/hartwell-autobio.html

2. Bridging Single Molecule and Continuum Mechanics Descriptions of Cell Adhesion

Professor Huajian Gao, Division of Engineering, Brown University, Providence, RI

Gao has been modeling cell adhesion at the scale of a single focal adhesion (FA). This talk will discuss our recent study on the behavior of molecular bond clusters between a cell and a substrate under mechanical forces induced by cell's own contractile or external loading.

Huajian Gao received his Ph.D. in Engineering Science from Harvard University in 1988. He served on the Stanford faculty between 1988 and 2002, and as a director in the Max Planck Society between 2001 and 2006. He is currently the Walter H. Annenberg Professor of Engineering at Brown University. For more details, see: <http://research.brown.edu/research/profile.php?id=1144175940>

3. Designed, Programmable Membranes

Professor Daniel A. Hammer, Bioengineering, Univ of Pennsylvania, Philadelphia, PA

Hammer will summarize efforts of the Penn MRSEC in membranes with designed and tunable properties to extend the functionality of native membrane systems via adding unique componentry, or to make entirely synthetic membranes with unique materials properties, including membranes from polymers or dendrimers; self-assembled dendrimeric pores; vesicles with the adhesive properties of leukocytes or those for imaging, drug delivery and controlled release.

Hammer is a professor of Bioengineering at the Penn, with degrees from Princeton (BSE) and the Penn (PhD). His work is in cell adhesion, cell motility, and biointerfacial phenomena. He has won many awards and has given a number of named lectureships. For more details, see: http://www.seas.upenn.edu/be/dir/details/daniel_hammer_details.html

4. Technology Development for Low-Cost Single-Cell Biology

Professor Babak A. Parviz, EE Dept & Micro-scale Life Sciences Center, University of Washington

This presentation briefly introduces the research activities undertaken at the NIH-Micro-scale Life Sciences Center (MLSC) a confluence of a multi-disciplinary research at the UW, focusing on building tools for conducting biological experiments at the single-cell level, and discusses recent progress in electronic detection of biomolecules and self-assembling miniature fluorescent detection systems.

Parviz received his graduate degrees in EE and Physics from the Michigan (2000). Soon afterwards, he was a product manager for integrated photonics at Nanovation. He did his postdoctoral fellowship in the Chem. & Chem. Biology at Harvard in 2002-04. He has been with the U. of Washington since Oct. 2003 where he serves as the Assoc. Director of MLSC. He is a recent recipient of the MIT Technology Review's TR35 Award (2007). For more information, see: http://www.ee.washington.edu/faculty/parviz_babak/