Monday Lunch, October 15, 2007

Symposium Plenary Lecture

Room: 6C - Session SP-MoL

Symposium Plenary Lecture

12:00pm **SP-MoL1 NanoSystems Biology and New Technologies for in vitro & in vivo Diagnostics of Cancer**, *J.R. Heath*, The California Institute of Technology **INVITED**
The emerging world of personalized, preventative, predictive, and participatory (P4) medicine will likely be enabled by the developing field of systems biology. Systems biology and P4 medicine both data driven and, accordingly, both require new tools for making large numbers of measurements rapidly, quantitatively, and at practically zero cost. Microfluidics, chemical, and nanotechnologies will revolutionize our ability to generate comprehensive data sets that span from individual cells to patients, and will allow us to build multiparameter analysis tools (quantitating genes, proteins, and cells) for achieving an informative in vitro disease diagnosis, as well as in vivo molecular imaging probes for spatially localizing specific diseases. However, the requirement that the measurements be done at extremely low cost (information becomes the commodity of value) imposes severe restrictions on these emerging technologies. Using cancer as a theme, I will describe the state-of-the-art in terms of network models of human diseases, and I will describe how those models may be harnessed for information that can impact the clinical care of cancer. I will then describe a suite of multiparameter diagnostics technologies that we are developing in my lab in concert with other groups, with both near and far term applications targeted.

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