



Translational Systems Biology: Connectivity, Network Models and Panel Biomarker Discoveries

Jake Yue Chen, PhD

Assistant Professor

Department of Informatics & Computer and Information Science
Indiana University – Purdue University Indianapolis

Friday, April 4, 2008

2:00 pm – 3:00 pm

COOK 3118 A&B

Abstract:

Systems biology is an emerging research area that aims to study complex molecular mechanisms of cells in the context of molecular networks and biological pathways. “Translational systems biology”, which I modeled after the term “translational medicine”, is the application of systems biology techniques to post-genome drug discovery and biomarker discovery problems. Translational systems biology relies on the development of tools to enable the iterative development of connectivity maps, network models, and predictive biology solutions. For each of these three topic areas, I will describe recent research trends and our work. I will describe our c-maps web server, which integrates text mining and conventional data mining techniques, to connect genes with drug compounds in their disease context. I will describe SPINNER, a new simple yet effective algorithm to rank proteins/genes based on biomolecular interaction networks. I will also describe GeneTerrain, a visualization software tool based on molecular network models of a disease, to discover and test molecular biomarkers.