

Computation and **I**nformatics in **B**iology and **M**edicine
Training Program Retreat

1:15 p.m. Presentation

John Yin

Associate Professor
Department of Chemical and Biological Engineering
University of Wisconsin-Madison

***From Genome to Organism:
A Virus-world View***

Abstract:

Our modern understanding of living systems has been largely shaped by a reliance on the reductionist approach: break open the cell, isolate a subset of molecular constituents, probe how each works in isolation, and repeat the process. Since the triumphant discovery of the DNA double-helix half a century ago, this approach has revealed the identity and roles of the key cellular players. However, times are changing. Completion of numerous genome-sequencing projects are now spurring the development of new approaches that aim to provide us with an integrated understanding of complex biological systems. It is now reasonable to begin to ask how the collective encoded processes defined by the genome of an organism affect its growth in a specific environment. We have begun to address such questions using the tools of chemical reaction engineering and computer modeling. We simulate how the interplay of multi-molecular processes defined by the genome of a simple virus (phage T7) guides the manufacture of its viral progeny within the cell. This approach enables us to design novel anti-viral strategies, track the utilization of host-cell resources, and begin to understand how 'simple' genomes work.

Friday, October 3rd

Pyle Center, Alumni Lounge
702 Langdon Street
9:00 a.m. – 5:00 p.m.