Please join us in one of the Shepherd S-STEM Club Seminars:

A Quantitative Systems Perspective on Cancer, Immunoevasion, and Somatic Evolution

By Dr. David J. Klinke, II

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Time and location: 2:10-3pm, Wednesday April 9, 2014 @ BY 108

Abstract: Quantitative and systems pharmacology is an emerging field that integrates a systems perspective with advances in quantitative biology, mathematical modeling, and simulation to improve human health using therapies. One of major challenges to human health in western societies is cancer. More recently, there is increasing realization that one should view cancer from an evolutionary perspective. Evolutionary processes all have three common attributes: heterogeneity, dynamics, and selective fitness landscapes. In engineering terms, the selective fitness landscape in cancer is comprised of a series of control motifs that regulate tissue homeostasis. Generally, identifying how these control motifs regulate tissue homeostasis in health and disease is a central challenge in translating our knowledge of biological components into viable therapeutic strategies. In this talk, I will discuss our systems pharmacology approach to cancer that draws upon concepts from somatic evolution and engineered systems.

David J. Klinke II is an Associate Professor of Chemical Engineering at West Virginia University. In addition to his position in Chemical Engineering, he is a member of the Mary Babb Randolph Cancer Center and an Adjunct Assistant Professor of Microbiology, Immunology & Cell Biology in the WVU School of Medicine. He graduated summa cum laude with a Bachelor’s degree in Chemical Engineering from Virginia Tech. He earned his Masters and PhD in Chemical Engineering from Northwestern University, where his research focus was on developing rule-based models of petrochemical chemistry. From 1999 until joining WVU in 2006, he provided strategic direction in developing mathematical models of disease for one of the mathematical models of disease for one of the commercial pioneers in the emerging field of systems pharmacology. Upon returning to academia, his research program integrates ideas drawn from evolution, probability, statistics, high performance computing, and chemical kinetics with high-content experimental assays and proteomic methods to address outstanding problems in cancer immunology and cellular signal transduction. In recognition of his on-going work, he received a CAREER award from the National Science Foundation in 2011 and was promoted to Associate Professor with tenure in 2012.

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