



Channing Network Science Seminar

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The Variation Game: Studying Impact of Genetic and Post-Transcriptional Variations at the Systems Level

In the beginning of the 21st century, we are experiencing tremendous societal and economic impact of common diseases that are molecularly and genetically complex. These complex diseases include cancer, neurological disorders, heart disease, diabetes, and many others. Recent advances in the Next Generation Sequencing (NGS) technology have provided us with the large volumes of data, revealing that many complex diseases are linked to the variations in the key genetic mechanisms, as compared to the data from the healthy individuals. In this talk, I will introduce our recent work on understanding the effects of genetic, structural, and post-transcriptional variations associated with complex genetic disorders, with the focus on studying how these variants can impact individual molecular interactions and large-scale interaction networks. My talk will consist of two parts. In the first part, I will discuss several projects where we use information about the disease variants extracted from the NGS data to characterize the variant's functional effect, determine whether its source is a healthy or disease sample, or predict the disease outcomes based on the variant repertoire. In the second part, I will describe our recent approaches to understand functional footprints of the groups of variants on the systems scale.

Bio: Dmitry Korkin is an Associate Professor with the Department of Computer Science and Bioinformatics and Computational Biology Program at Worcester Polytechnic Institute. He obtained his Ph.D. in 2003 at the University of New Brunswick, Canada followed by a postdoc at the University of California, San Francisco. His recent awards include 2009 National Science Foundation CAREER Award and 2013 Junior Research Faculty of the Year Award at the University of Missouri. His research projects have been supported through National Science Foundation, US Dept. of Agriculture, and Dept. of Education. His current research interests are in bioinformatics and systems biology of complex disease, computational genomics, high volume biological data mining, and machine learning.

Hosted by Yang-Yu Liu