Numerical Analysis and Scientific Computing Seminar

Topological and Functional Properties of Proteins in Protein-Protein Interaction Networks

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Abstract: I will discuss the connection between the topological properties of proteins in Protein-Protein Interaction (PPI) networks and their biological relevance focusing on hubs, i.e. proteins with a large number of interacting partners. In particular, the following questions will be addressed: Do hub proteins tend to be more essential than non-hub proteins? Do they play a central role in modular organization of the protein interaction network? Are they more evolutionarily conserved? Are there structural properties that characterize hub proteins?

I will then present recently developed algorithms for identifying groups of highly connected proteins, or complexes, that are evolutionary conserved. Given the networks of two organisms, the algorithms uncover sub-networks of proteins that relate in biological function and topology of interactions. The discovered conserved sub-networks have a general topology and need not to correspond to specific interaction patterns, so that they more closely fit the models of functional complexes proposed in the literature.

Wednesday, December 5, 2012, 12:50 pm

Mathematics and Science Center: W306

Mathematics and Computer Science
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