Survey: Functional Module Detection from Protein-Protein Interaction Networks

Abstract:

A protein-protein interaction (PPI) network is a biomolecule relationship network that plays an important role in biological activities. Studies of functional modules in a PPI network contribute greatly to the understanding of biological mechanism. With the development of life science and computing science, a great amount of PPI data has been acquired by various experimental and computational approaches, which presents a significant challenge of detecting functional modules in a PPI network. To address this challenge, many functional module detecting methods have been developed. In this survey, we first analyze the existing problems in detecting functional modules and discuss the countermeasures in the data preprocess and postprocess. Second, we introduce some special metrics for distance or graph developed in clustering process of proteins. Third, we give a classification system of functional module detecting methods and describe some existing detection methods in each category. Fourth, we list databases in common use and conduct performance comparisons of several typical algorithms by popular measurements. Finally, we present the prospects and references for researchers engaged in analyzing PPI networks.