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Principles of protein-protein interactions

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ABSTRACT

In the postgenomic era, one of the most interesting and important challenges is to understand protein interactions on a large scale. The physical interactions between protein domains are fundamental to the workings of a cell: in multi-domain polypeptide chains, in multi-subunit proteins and in transient complexes between proteins that also exist independently. Thus experimental investigation of protein-protein interactions has been extensive, including recent large-scale screens using mass spectrometry. The role of computational research on protein-protein interactions encompasses not only prediction, but also understanding the nature of the interactions and their three-dimensional structures. I will discuss properties such as sequence conservation and co-regulation of genes and proteins involved in different types of physical interactions. Given that all proteins consist of their evolutionary units, the domains, all interactions occur between these domains. The interactions between domains belonging to different protein families will be the second topic of my talk.