Toward Structure Based Protein Drug Design

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Abstract

Protein-protein interactions play key roles in the cell and are proposed as promising drug targets. However, as protein-protein interfaces are usually large and shallow, it is difficult to design small molecule binders. An alternative is to design protein drugs that can bind to protein-protein interface. We have been developing methods for designing novel protein-protein interaction pairs. Three strategies have been developed : key functional site grafting, *de novo* binding protein design, and docking based binding protein virtual screening. These methods have been successfully applied in designing erythropoietin receptor binding proteins, tumor necrosis factor binding peptides, as well as metal binding proteins. Successful examples and the current challenges for protein drug design will be discussed.