

Problem
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Databases of Protein Interaction Interfaces Defined In Three Dimensions

The Protein Structural Interactome Map, is a database of all the structurally observed interactions among protein domains of known three-dimensional structures in the PDB. <http://interpare.net/>. This database can be searched with limited queries.

Protcom is more easily searched. <http://www.ces.clemson.edu/compbio/protcom/> This database has homo- and hetero- protein-protein complexes and counting domains contains 17, 000 entries: 1350 two-chain protein hetero-complexes, 7773 homodimers and 1589 single chain proteins split into two domains. The remaining are constructed from PDB files for multi-chain protein complexes but splitting out two interacting chains. This database can be searched.

Kundrotas PJ, Alexov E. PROTCOM: searchable database of protein complexes enhanced with domain-domain structures. *Nucleic Acids Res.* 2007 Jan; 35:D575-9.

Problem

1. Find a protein complex of just two non identical proteins that has less than 1300 Å square of surface interactions, and has at least 5 Arg on one partner and 5 Asp on the second partner that are in the interface.
2. What is the nature of the interface between the A and B proteins? Describe the electrostatic roles of the Arg and Asp side chains. What are the major hydrophobic interactions? Do the IG like domains used CDR's to form interactions with the partner?