**DETECTIVE**

DETECTIVE[1] is a tool developed by Mark B. Swindells which identifies structural domains based on the assumption that each domain will be constituted of a hydrophobic core except for extremely small proteins which are held together by numerous disulfide bridges.

In his companion paper[2], he described a conceptually simple and computationally efficient algorithm for identifying hydrophobic cores in proteins. As per him, a hydrophobic core is a collection of residue sites with low solvent accessibility, which are located in regions of regular secondary structure and whose nonpolar side-chain moieties interact with one another. This definition serves as the working premise for domain identification which is described in the following steps. (1)Hydrophobic cores are identified with 7% solvent accessibility[3] cutoff. (2)Then, Isolated cores and cores having less than 5 sites are removed. (3)Further, sequentially adjacent cores are merged together to initiate the initial domain assignment process. (4)Next, these initial domains are extended to the entire molecule by merging the initially unassigned sites to that domain with which it has the highest number of contacts. Again, isolated sites are removed and adjacent sites are merged in a similar manner as in steps 2 & 3. (5) FInally, wherever possible, sites are extended to the ends of their appropriate secondary structures and assignments are extended to their N- & C- termini.

**References**

[1]: Swindells MB (1995a): A procedure for detecting structural domains in proteins. Protein Sci 4:103–112.

[2]: Swindells MB (1995b): A procedure for the automatic determination of hydrophobic cores in protein structures. Protein Sci 4:93–102.

[3]: Chothia C. 1976. The nature of the accessible and buried surface in proteins. JMolBiolIO5:1-14.