

The design and solid-phase synthesis of affinity ligands for transferrin

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Affinity chromatography is increasingly important as a capture or polishing step in the purification or production of proteins. The use of rational computer-aided design of ligands coupled with limited combinatorial synthesis based on triazine chemistry has proven successful in affording stable and specific affinity ligands. This presentation reports attempts to design and synthesize ligands for capturing transferrin, both the apo-form and the holo-form.

Transferrin is a glycoprotein of some 80.000 kDa. One molecule of transferrin binds two ferric iron ions. An unusual feature is that the release of iron from holo-transferrin results in a structural change which opens up binding targets which are only accessible in the apo-form. Attempts have been made to exploit this feature in the design of specific affinity ligands for apo-transferrin.

The propagation of animal cells in culture is important in biotechnology, both on a small scale and also on a larger scale, e.g. in the production of proteins by recombinant cells and by hybridoma cells in the production of monoclonal antibodies. Transferrin is a necessary component of media for growing many mammalian and other cells. It is presently produced from bovine plasma. An affinity method for its purification could be of economic importance.