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Peptide-Imprinted Polymer Beads

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Molecular imprinting produces synthetic receptors for specific target materials. Functional monomers are polymerised in presence of template molecules, immobilising the template in a 3-dimensional polymer network. Removal of the template molecule produces a polymeric material containing cavities which are specific in size and functionality for the template material and is therefore able to selectively rebind this material preferentially over close structural analogues.

Core-shell molecularly imprinted polymers (CS-MIP) have been synthesised previously, allowing the production of a surface imprinted material with easily accessible cavity sites^[1-3]. Research has shown that these polymers are able to selectively bind low molecular weight species and short peptide chains in an aqueous environment.

Current research aims to further examine the binding of peptide chains using CS-MIP for subsequent use in peptide purification and for the binding of biologically relevant proteins via the epitope approach^[4].

The system employs a poly(styrene-co-divinylbenzene) core surrounded by a shell of ethylene glycol dimethacrylate and oleyl phenyl hydrogen phosphate. Polymerisation occurs at 30 °C through redox initiation with ascorbic acid and potassium persulphate in order to optimise non-covalent interactions between the template and functional monomer.

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