Synthesis and Supramolecular Chemistry of Backbone Modified Cyclic Peptides

Peptides are Nature's scaffolds. They are used to position functional groups in a spatially well-defined manner to facilitate recognition between molecules (e.g. protein-small molecule and protein-protein interactions) and catalyse reactions (e.g. enzymes). However, the use of peptides as scaffolds in supramolecular chemistry has been little explored, primarily due to the inherent flexibility of small synthetic peptides. Cyclisation is one method of limiting this flexibility, but the synthesis of cyclic peptides can be difficult and is often low-yielding.

We are developing efficient syntheses of cyclic peptides and using these molecules as scaffolds for the formation of molecular receptors and in the design of self-assembling systems. The design and synthesis of some backbone modified cyclic peptide platforms, together with their supramolecular applications will be presented.