Conformationally restricted aza-macrocyclic complexes as chemokine receptor antagonists

Graeme McRobbie, Abid Khan, Elizabeth A. Lewis, Stephen J. Archibald
Department of Chemistry, The University of Hull, Hull, UK

Tetraaza macrocycles, such as cyclam and cyclen, form the basis of a number of chelators commonly used in biological and medical applications. Controlling the configuration of the resultant complexes can allow for the formation of kinetically stable metal complexes, and may influence the binding interactions with biological receptor sites. Macrocycles with alkyl chain bridges between ring nitrogens can disfavor or prohibit some potential configurations. Synthesis of a series of macrocyclic chelators was carried out. Complex formation with transition metals allowed characterization of the solid state coordination geometries and studies on solution behavior. Synthetic strategies were developed to allow the production of multi-macrocycle derivatives incorporating nitrogen bridges in different ring positions. In-vitro biological studies have been carried out with these compounds.

We have studied cell surface receptor interactions in competitive binding assays and protein/ antibody conjugation of mono and poly-macrocyclic compounds. Results on the synthesis of novel chelators and new constrained aza-macrocyclic derivatives will also be presented.