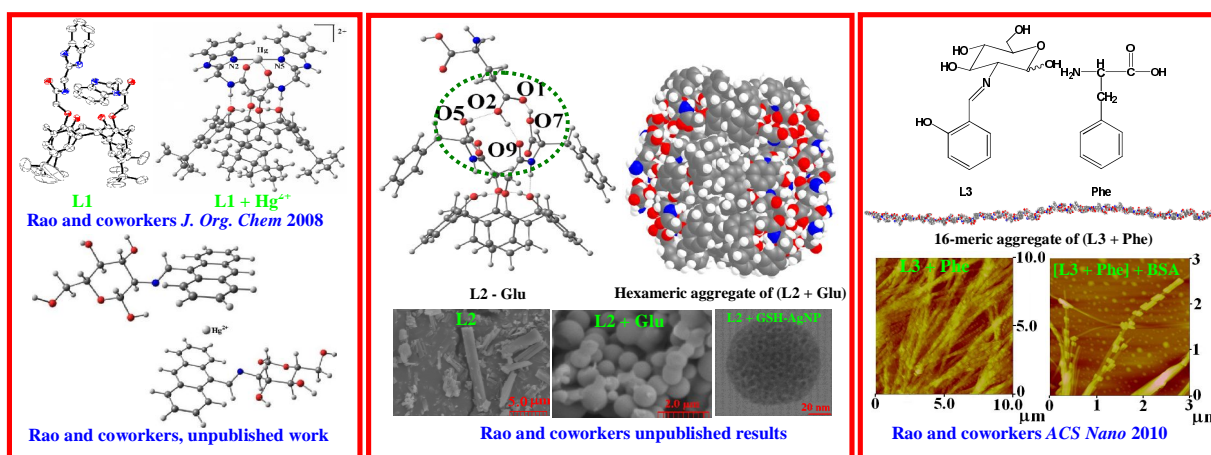


Manifestation of weak interactions by the conjugates of carbohydrates and calix[4]arenes leading to molecular recognition and supramolecular formations

Chebrolu Pulla Rao

Department of Chemistry, Indian Institute of Technology Bombay, Powai, Mumbai – 400 076, India. E-mail: cprao@iitb.ac.in

Functions of the metallo-enzymes are being carried out by selective complexation of the corresponding metal ion in the *reaction crevice* which takes place through the coordination of the side chains of the residues. Therefore, the recognition of metal ions and amino acids is important in biological inorganic chemistry. Corresponding model systems would be relevant and important in order to demonstrate the subtle interactions that lead to recognition followed by reactivity. Among these, the conjugates of calix[4]arene and carbohydrates are important owing to their specific binding core in the former, and water solubility and biocompatibility in the latter. We have recently shown that appropriately derivatized calix[4]arene or the glycoses can be tuned to exhibit selective recognition towards different metal ions and amino acids and in turn form interesting supramolecular species. Some of these based on glyco-conjugates includes the formation of nano-fibers and their discrimination of α -helical vs. β -sheet proteins, Hg^{2+} ion recognition through cation... π interactions, modifying cell agglutination by lectins and inhibition of glycosidases, to list a few. Similar manifestations were noticed even with the conjugates of calix[4]arene. Our results range from experimental to computational. A few of these are shown in the Figure to demonstrate their interactions. Therefore, this presentation is mainly focused at addressing the manifestation of weak interactions leading to the selective recognition of ions and molecules of biological and ecological importance and their extended utility to modify the properties of proteins and enzymes through their supramolecular formations.



Acknowledgements: I am grateful to IIT Bombay, all my coworkers and the funding agencies, DST, CSIR and DAE-BRNS.