Molecular Recognition Applications of Biomimetic Molecules

Sequence-specific, modular oligoamide foldamers are valuable targets for study and application because they serve as molecular scaffolds for the display of functional groups, emulating the arrangement of side chain functionality in biomolecules. Molecules in this class, including peptoids (N-substituted glycine oligomers) and their backbone-modified analogs, are readily prepared as diverse analogs on solid phase and have already found a range of interesting applications in biology. In this presentation, I'll report on our use of two classes of diversely functionalized N-substituted oligoamides for molecular recognition functions. First, we have investigated the interactions of azole-comprising N-substituted oligoamides with metal ions, including Zn\(^{2+}\). Second, I will address our recent work using self-associating water-soluble peptoids as components for array sensors to enable detection of small aromatic molecules, including potential environmental contaminants, in aqueous solution. Both of these studies represent new applications of synthetically accessible, tunable, and modular scaffolds for molecular recognition. Such an application can clarify fundamental chemistry insights into these phenomena. Additionally, both approaches hold exciting potential for the development of novel sensing or sequestration functions.