

MICHAEL NORTON, MASUDUR RAHMAN, DAVID NEFF, MANJIRA KUMAR, IAN WADDELL, and ANDREA HENSLEY, Department of Chemistry, Marshall University, Huntington, WV, 25755. **DNA origami platform development for the detection of metals in water.**

Many people are becoming increasingly interested in learning the composition of their drinking water. However, for a variety of reasons, only very limited information is available to the public and even to the suppliers of drinking water. Clearly, ubiquitous water testing would be ideal, and this challenge provides motivation for the analytical chemistry community to develop new approaches to quantitation. This project seeks to address this information gap through the development of thin organic arrays, composed of DNA, which are functionalized with molecular species which can selectively bind metals of interest and enable optical detection and characterization of these reversible binding events. Progress in two areas, DNA platform development and ligand design will be presented.

Tiles constructed from DNA have been generated which can present a variety of molecular species with a local periodicity of ~100 nm. Modulation of the strength and directionality of interaction of these tiles has been shown to lead to partial or local ordering of these tiles, an important step toward the construction of large scale arrays.

Organic ligand systems for two metals of interest, Al and U, have been designed. These ligand designs include two modules, one module enabling covalent attachment to the DNA based platforms through a DNA linker sequence, while the other module supports a binding and reporting function. The synthesis of these ligand systems is currently in progress.

Funding for this project was provided by the NASA West Virginia Space Grant Consortium and NSF Cooperative Agreement No. OIA-1458952.