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"DNA-Based Biosensors Using Target-Directed Macromolecular Assembly and disassembly"

Abstract: Nucleic acids are exquisitely adept at molecular recognition and self-assembly, enabling them to direct nearly all of the processes that make life possible. These capabilities have been fine-tuned by billions of years of evolution, and more recently, have been harnessed in the laboratory to enable the use of DNA and RNA for applications that are completely unrelated to their canonical biological roles. In our lab, we utilize DNA aptamers as recognition elements for the development of new small-molecule detection assays. Specifically, interaction of an aptamer with its target is designed to direct assembly or disassembly of DNA or DNA-polymer conjugates, providing an output that can be observed visually or spectroscopically. Small molecule targets of interest include drugs, metabolites, and toxins.

Brief Bio: Jennifer Heemstra received her B.S. in Chemistry from the University of California, Irvine, in 2000. In 2005, she completed her Ph.D. with Prof. Jeffrey Moore at the University of Illinois, Urbana-Champaign, and after a brief stint in industry as a medicinal chemist, she moved to Harvard University to pursue postdoctoral research with Prof. David Liu. In 2010, Jennifer began her independent career in the Department of Chemistry at the University of Utah. Her research group is focused on harnessing the molecular recognition and self-assembly properties of nucleic acids for applications in biosensing and bioimaging.