Denver

CHEMISTRY

Fall 2023

Seminar Series

11am-12pm

Dec 8th

In-Person

NC 1130

Prof. Yi Xiao

Department of Chemistry

North Carolina State University

"Beauty Through Simplicity - Using aptamers to detect small molecules"

On-site small-molecule detection is important for applications such as environmental monitoring, food safety, law enforcement, and medical diagnostics. The most popular biosensors currently are immunoassays, which rely on antibodies to recognize target analytes. However, these assays are greatly limited by the costly and time-consuming process of developing, validating, and producing new target-specific antibodies, and their usefulness and reliability can also be impeded by batch-to-batch variation and short shelf-life. Aptamers offer a promising alternative that can overcome these limitations. They are single-stranded oligonucleotide-based affinity reagents isolated by in vitro Systematic Evolution of Ligands by EXponential enrichment (SELEX) procedures to bind specific molecules with high affinity. This talk will discuss recent advancements made by our group in three different facets of aptamer technologies in the pursuit of translating aptamers from prototype research materials to commercially available analytical assays and devices. These include innovative selection strategies for the systematic evolution of ligands by exponential enrichment (SELEX) technique, the development of novel high-throughput aptamer characterization methods, innovative concepts in aptamer engineering, and the creation of cost-effective optical and electrochemical assays and sensors for the detection of small molecule analytes in various biological matrices.

1. Acc. Chem. Res. 2023, 56, 1731 – 1743.
2. J. Am. Chem. Soc. 2023, 145, 194 – 206.
3. Nucleic Acids Res. 2023, 51, e19.
4. J. Am. Chem. Soc., 2018, 140, 9961 – 9971

For more details on CU Denver-Chemistry seminar series: https://clas.ucdenver.edu/chemistry/seminars-and-events