Fiber- Optrode based SERS Aptasensors for Environmental Analysis

Reagentless surface-enhanced Raman scattering (SERS) sensors could have a significant impact in environmental analysis because of their mechanism, which makes them ideal for *in--situ* analysis and continuous monitoring of environmental pollutant. We have established a protocol to detect small molecules using aptamers in reagentless SERS sensors. With the help of this protocol, we are currently focusing on the detection of Estradiol (Es2), which is a very known water contaminant & EDC (endocrine disrupting chemicals). Our aptamer-based sensors have achieved a limit of detection of 15 ppb in Ohio river water. To translate this technology toward real-world deployment, we are integrating the sensors into a fiber-optrode platform, creating a practical tool for continuous, on-site monitoring of pollutants. This work highlights the potential of aptamer-based reagentless SERS systems to advance next-generation environmental sensing technologies.