

**DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE**  
**SEMINAR SERIES**  
**FALL 2021**

**DATE:** WEDNESDAY, NOVEMBER 10, 2021

**LOCATION:** Kupfrian Hall - 117

**TIME:** 1:00-2:20PM

**GUEST SPEAKER**

Dr. Xin Yan  
Department of Chemistry  
Texas A&M University  
College Station, TX

**TOPIC**

Accelerated Microdroplet Reactions and their applications in Lipid Analysis

**ABSTRACT**

Recent findings have shown that microdroplets can be used to dramatically enhance reaction rates. These microdroplets used as tiny reactors are usually generated in polydispersed form by spray methods under ambient conditions, and high-resolution mass spectrometry has primarily been used as the detection method. In this talk, I will show microdroplets provide unique reaction environments that can be used to accelerate reactions, and can be tunable to switch on derivatization of biomolecules for structural characterization. Lipid analysis using microdroplet technology will be presented as an example. Lipids play a vital role in maintaining cellular functions. Altered lipid metabolism is currently considered a hallmark of many diseases, which highlights the importance of the characterization of lipid composition in understanding, diagnosing, and treating pathologies. I will introduce the microdroplet electrochemical methods capable of resolving different types of isomers commonly encountered in lipid samples. The methods take advantage of the voltage-controlled and dramatically accelerated electrochemical derivatization of lipid isomers in microdroplets to achieve structural elucidation. Applications of the electrochemical mass spectrometry methods in real sample analysis will also be included.

**BIO**

Dr. Xin Yan received her Ph.D. in Chemistry under the mentorship of Professor R. Graham Cooks at Purdue University in 2015. She then joined Professor Richard N. Zare's group at Stanford University as a postdoctoral researcher. She joined Texas A&M University as an Assistant Professor in 2018. Her research group develops microdroplet reactions and applies them to address the deficiencies in lipid structural analysis and to accelerate the discovery of transition metal catalysis. Dr. Yan was awarded an American Society for Mass Spectrometry Research Award in 2021, and NIH MIRA award.

**Committee members:**

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