

# BIOENGINEERING

PRESENTS

## Colloidal Metal Nanocrystals: Controlled Synthesis and Applications in Medical Diagnostics



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2101 ENGINEERING V

**Xiaohu Xia, Ph.D**

UCF

Assistant Professor,  
Department of Chemistry

### ABSTRACT:

Nanocrystals made of noble metals (including Au, Ag, Pd, Pt, Rh, Ir and Ru) are finding widespread use ranging from biomedicine to energy conversion, electronics, and environmental protection. Controlled synthesis is one of the most effective strategies for precisely tailoring their physicochemical properties and thus optimizing their performance in certain applications. Although the first documented synthesis of metal nanocrystals can be traced back to the fantastic work on Au colloids by Michael Faraday in the 19th century, only within the past few decades have the methodologies become available for generating nanocrystals with well-controlled structures (*i.e.*, shapes, sizes, and chemical compositions). In the first part of this talk, I will introduce my recent studies on rational design and experimental synthesis of noble-metal nanocrystals with desired structures at the atomic level. In the second part, I will discuss my work on the applications of engineered metal nanostructures in clinical diagnostics. Examples of ultrasensitive and easy-to-use diagnostic techniques and their use in detecting cancer biomarkers from human blood samples will be highlighted.

### BIOGRAPHY:

Dr. Xiaohu Xia has been a tenure-track Assistant Professor at University of Central Florida (UCF) since May 2018. Prior to his appointment at UCF, he worked at Michigan Tech as an assistant professor from 2014-2018 and at Georgia Tech as a postdoctoral fellow from 2012 to 2014. He is a recipient of the NSF CAREER Award (class of 2017). His research interests include the design and synthesis of novel nanostructures and exploration of their applications in biomedicine and catalysis. So far, he has published 48 papers in peer-reviewed journals. His publications have been cited over 4,000 times, with an h-index of 32. In his independent career, his research work has been highlighted by U.S. National Science Foundation (NSF), Department of Energy (DOE), Centers for Disease Control and Prevention (CDC), and Chemical & Engineering (C&EN) News.