

# Chip-based Nanostructure-Enabled Biosensing and Diagnostics

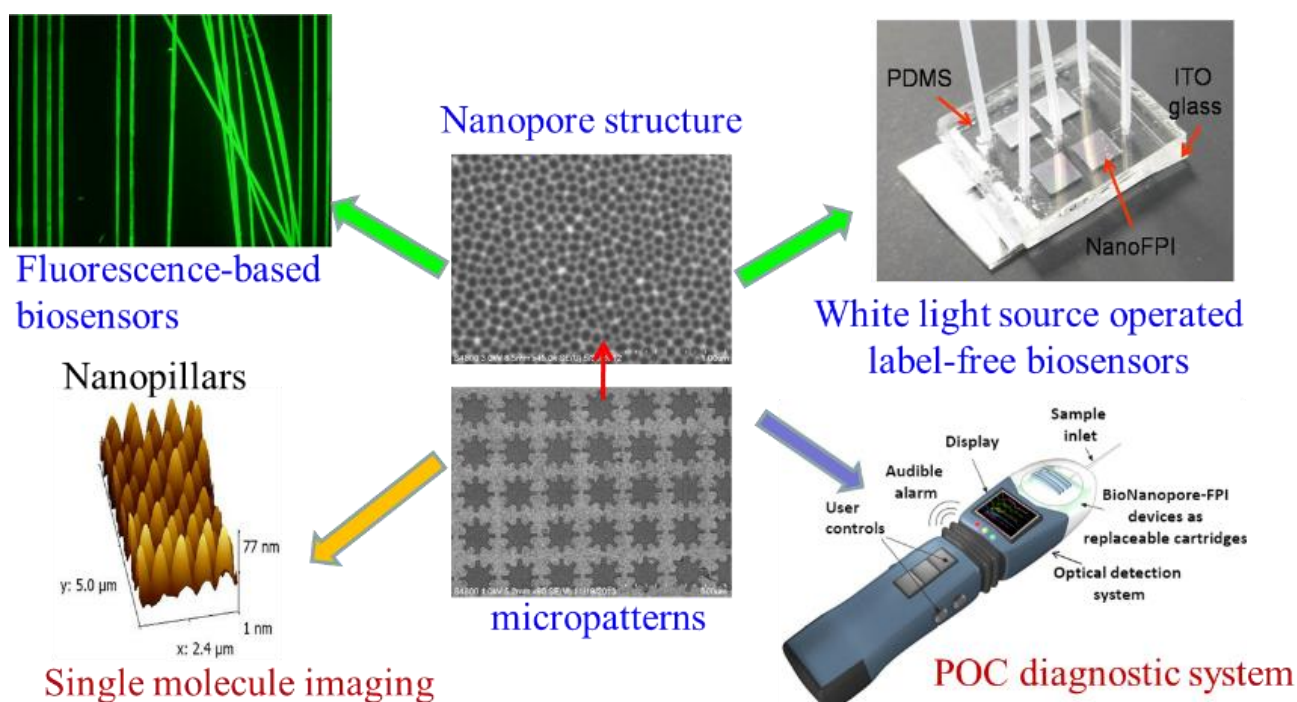
Long Que

Department of Electrical and Computer Engineering, Iowa State University, Ames, 50011, USA

Corresponding and Presenting Author. E-mail: lque@iastate.edu

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## Graphical Abstract



## Abstract

Nanomaterials and nanostructures have become the enabling technology for enhancing the performance of the micro-nanodevices for biosensing and diagnostics. These devices and systems would have broad impact in health care, biomedical engineering, life science, and personalized medicine. The objective of research at our lab is to develop a variety of new nanostructure-enabled bio-analytical tools with improved functionality and performance. Optical and electrical effects on biomolecules and cells in micro-nanoscale domains are utilized for enhancing the performance of these devices and systems. Detection is achieved with both fluorescence and label-free methods. In this talk, I will cover a couple of research topics. The first topic is about an optical sensing platform and its applications for label-free detection of disease biomarkers and plant hormones. The second topic is about a fluorescence-enhancement platform for immunosensing and cell secretion monitoring. Given their ultra-sensitivity, high specificity and selectivity along with their operational simplicity,

inexpensiveness and portability, these technical platforms can be developed for point-of-care (POC) diagnostics.

**Keywords:** Nanostructures; label-free optical nanosensor; fluorescence biosensor.

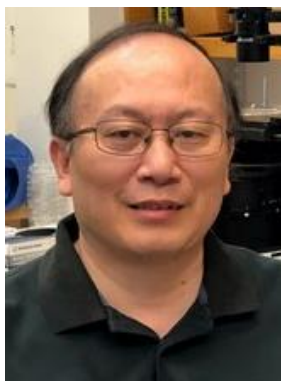
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## Biography of Presenting Author



**Long Que** is an Associate Professor in Electrical Engineering at Iowa State University. He previously worked at GE-Global Research Center. He received his PhD in Electrical Engineering from University of Wisconsin-Madison. He was a visiting scholar at the Center for Wireless Integrated Microsystems at University of Michigan at Ann Arbor and at the Center for Nanoscale Materials at Argonne National Laboratories. Dr. Que has authored three book chapters and published over 100 papers in major conferences and journals and has over 25 granted and pending US patents. Dr. Que received invention awards from GE, NSF-CAREER Award, outstanding research and invention awards from Board of Regents of Louisiana. His research group received the Best Student Paper Award at IEEE SENSORS Conference 2016.

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