

## NANO-BME Seminar

**Time: 11:00AM Wednesday, April 27**

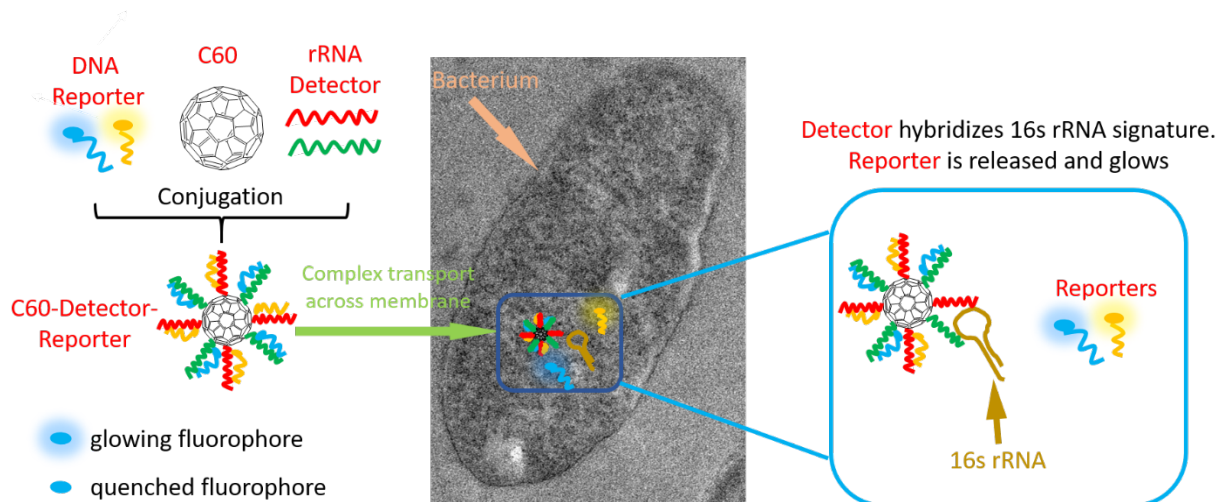
**Location: EP251-A and <https://sdsmt.zoom.us/j/94046899625>**

### Novel C60 Nanosensors for Identifying Bacterial Pathogens by Targeting 16S rRNA

Dr. Qingsu Cheng, Ph.D., Faculty Candidate

Department of Electrical and Biomedical Engineering  
University of Nevada Reno

**Abstract:** Detection and identification of microbial pathogens, such as *Salmonella* spp. and *E.coli* O157:H7, are crucial for public health and food safety. Beyond illness and death caused by exposure to foodborne bacteria, each incident also causes a loss of revenue and evokes new regulatory constraints. Given the magnitude of the issues on health and the economy, technological innovations are needed for rapid and low-cost surveillance of foodborne bacteria. We aim to print C60 nanosensors in a microwell chip for multiplexing foodborne bacteria. We used bioinformatic analyses to identify and screen targeted sequences, synthesized C60 nanosensors through EDC/NHS chemistry, and validated C60 nanosensors via advanced microscopy coupled with image analyses. We then pioneered C60 nanosensors to identify *E.coli* O157:H7 in inoculated meat and multiplexed five bacteria in a microwell chip. The results have shown that C60 nanosensors effectively identify foodborne pathogens at the single-cell level despite the cellular status, such as live, dead, and dormant.



**About the speaker:** Qingsu Cheng is currently a Research Scientist in the Department of Electrical and Biomedical Engineering at the University of Nevada Reno. His research focuses on (i) developing mechanically tunable 3D tissue models for mammographic density, (ii) discovering new therapeutic proteins in breast cancer stroma, and (iii) developing C60 nanosensors that can profile microbiome. He has gained success in grantsmanship, scholarly activities, entrepreneurship, and mentoring students.

