SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING
Website: https://cde.nus.edu.sg/ece

Area: Microelectronic Technologies & Devices (MTD)

Host: Assoc Prof Zhu Chunxiang

TOPIC	:	**Single-atom doping of Cu_2O nanowires with platinum for boosting electrochemical sensing toward glucose**
SPEAKER	:	**Mr Wang Zhiyong** **Graduate Student, ECE Dept, NUS**
DATE	:	**Tuesday, 23 September 2025**
TIME	:	**9:00AM to 10:00AM**
VENUE	:	**Join Zoom Meeting** **https://nus-sg.zoom.us/j/86399321374?pwd=SntsaxroO4YsblW2VxC76a75Q7Pd2q.1** **Meeting ID: 863 9932 1374** **Passcode: 508325**

ABSTRACT

Glucose in the human body, predominantly sourced from dietary carbohydrates and liver glycogen stores, plays a crucial role in many health conditions. Abnormal glucose levels can cause many disorders, including diabetes, heart disease, stroke, kidney disease, and neuropathy. Hence, glucose profiling and monitoring are of paramount significance to facilitate earlier disease diagnosis and further achieve precision and personalized medicine. Contemporary gold standards in glucose evaluation rely heavily on finger-pricked blood analyses based on the enzyme-catalyzed reaction, which is evitably invasive and painful. Meantime, these enzymatic glucose sensors have several drawbacks, such as high fabrication cost, fragility, poor sensitivity, and vulnerability to environmental factors that can cause enzyme denaturation. Herein, a facile approach for dispersing single-atom doping of Cu_2O with Pt on a copper foam substrate (Pt_1/Cu_2O@CF) via the electrochemical deposition process is proposed. The specific nanostructure of the single-atom catalyst has been elaborately revealed with the aid of atomic resolution scanning transmission electron microscopy (STEM) and X-ray absorption fine structure spectroscopy (XAS). The as-fabricated Pt_1/Cu_2O@CF biosensor with satisfactory scalability exhibits a low limit of detection (1 μM), ultrahigh sensitivity (31.55 mA mM^{-1} cm^{-2}), excellent selectivity, and good reliability toward glucose. This work sheds light on the applications of single-atom catalysts for designing ultrasensitive electrochemical biosensors.

BIOGRAPHY

Mr. Zhiyong Wang is a dedicated researcher specializing in flexible electronics, holding a master's degree in natural science of chemistry from University of Science and Technology of China (USTC). Currently pursuing a Ph.D. at the National University of Singapore (NUS) under Associate Professor Zhu Chunxiang, Zhiyong's research interests include microelectronic technologies & devices, low-dimensional materials growth and characterization, and thin-film transistors.