



**Wolfson Department of Chemical Engineering Seminar**

**Monday, June 5<sup>th</sup>, 2023 at 13:30**

**Room 6**

**Smart Nanosensors for Overall Health Monitoring and  
Diagnosis of Cardiac Diseases**

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**PhD Seminar**

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Cardiovascular diseases (CVDs) are a leading global cause of mortality and morbidity, responsible for 17.9 million deaths annually according to the World Health Organization (WHO). The impact of these diseases is significant, affecting individual patients, causing further health complications, and increasing the burden on the healthcare systems. Current methods for overall health monitoring and diagnosing CVDs are painful, time-consuming, require trained personnel, and cannot provide rapid, continuous, or online measurements. Therefore, new methods for health tracking and diagnosis of heart conditions are needed. In recent years, there has been a growing interest in using wearable and implantable sensors to help detect, prevent, and treat these conditions. These devices offer unique advantages over other conventional monitoring applications in the healthcare and clinical fields, as they can closely and accurately monitor vital signals within the body, which improves health safety and quality of life for patients. Herein, we developed smart, flexible, biocompatible, and biodegradable nanosensors, both wearable and implantable, for online overall health monitoring, with a focus on CVDs, enabling real-time diagnosis and early detection of health disorders, followed by alerting patients in time. The nanosensors are composed of an array of chemical sensors, biosensors, and pressure sensors, enabling multiplex sensing of health parameters. The nanosensors are integrated with Artificial Intelligence (AI) capabilities for data fusion to provide precise health monitoring and diagnosis. This innovative approach has the potential to provide new routes for disease diagnosis and monitoring, leading to future meaningful lifesaving applications.

**Refreshments will be served at 13:15**