



**Wolfson Department of Chemical Engineering Seminar  
Lecture Hall 6, Wolfson Department of Chemical Engineering,  
Wednesday November 14<sup>th</sup> at 1:30pm**

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**Adhesive Sensors for Detection of Tuberculosis from Skin**

Adhesive patch aims to research, develop, and validate a novel non-invasive wearable sensing patch for detection of infectious disease at point of care, specifically tuberculosis (TB), from skin, with an ability to serve as a monitoring and epidemic control tool. The patch uses a novel intelligent hybrid sensor array to detect disease-specific volatile organic compounds (VOCs) from the surface of the skin, enabling rapid and highly-accurate diagnosis using a small device. Tuberculosis (TB) is an infectious disease with not specific symptoms, thus leading to delayed diagnosis and further spread. In 2017, there were 10 million new TB cases, and 1.6 million deaths. About 95% of TB cases occur in developing countries. Currently available diagnostic methods have limitations in developing countries; therefore, a new diagnostic tool for TB diagnosis is required. Clinical studies conducted in several sites including South Africa, India and Latvia resulted A global classifier based on the sensor array discriminated between active pulmonary TB status and non-TB and healthy statuses with 90% sensitivity, 91.2% specificity and 90.4% accuracy. Based on these results, an online patch with the sensors is currently tested in a Latvian clinical site. GC-/MS analysis indicated on a unique pattern of VOCs which significantly discriminate between active and non-TB participants. These preliminary results present the first evidence for emission of TB VOCs from the skin. This adhesive patch aims to demonstrate a technological leap forward for wearable patches for TB detection that meets the requirements of the World Health Organization (WHO) for a triage test with 90% to 95% sensitivity and specificity of >70%.

Refreshments will be served at 1:15pm