



Wolfson Department of Chemical Engineering Graduate Seminar

Lecture Hall 6, Wolfson Department of Chemical Engineering, **February 7, 2016, Sunday, 11:00**

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Ultrasensitive Silicon Nanowire Field Effect Transistor for Real-World Applications

Cancer is a devastating disease with several medicinal challenges including delayed diagnosis, low efficacy of the anti-cancer therapy and heterogeneity of the disease. In addition, cancer is often misdiagnosed as it has several common symptoms with non-cancerous diseases. Therefore, there is an urgent unmet need for inexpensive and non-invasive technology that would allow: efficient early detection of cancer and bed-side fast assessment of treatment efficacy in order to change the therapeutic approach accordingly. In the current research, we have developed molecularly modified silicon nanowire field effect transistor (SiNW FET) sensors for the detection of multiple diseases via volatile organic compounds (VOCs). These diseases include Gastric cancer (GC), Lung cancer (LC) and non-cancerous Lung diseases (represented by Asthma and COPD). Various features can be extracted from the characteristic curves of the devices, supplying a wide assortment of independent signals to be used as virtual sensors. Following detection of Gastric cancer, analysis has indicated that the sensors differentiate between simulations of breath samples corresponding to each type of disease; LC, GC, and Asthma/COPD. The sensors have also shown strong ability to differentiate real breath samples collected from patients suffering from the different diseases, as well as healthy control patients. The accuracy of the classification is above 80% in most cases, making our device suitable for preliminary testing in the Cancer diagnostic process.

Refreshments served at 10:45