A 4-year EngD studentship in Integrated Microfluidic E-SERS Platform for Biosensing

Supervisor: Dr. Tung Chun Lee

Application deadline: 30 June 2019
Start date: 23 September 2019
Location: London

Topics: nanomaterials design and fabrication, surface-enhanced Raman scattering, electrochemistry, microfluidics, biosensing

The Studentship
The UCL Centre for Doctoral Training in Molecular Modelling and Materials Science is offering a fully funded studentship to a highly motivated candidate to start in September 2019. The studentship will cover tuition fees at UK/EU rate plus a tax-free maintenance stipend (e.g. £18,277 pa) for four years. The project will be in collaboration with Camtech Innovations Ltd. in Cambridge. The student will carry out his/her doctoral research mainly in the Lee group at the UCL Bloomsbury Campus. Short-term visits to Camtech to perform microfluidics design and fabrication should be expected. Due to funding restrictions, this studentship is only open to applicants from the UK and EU, who have been resident in the UK for at least 3 years preceding their start on the programme or have indefinite leave to remain in the UK.

The Project
Electrochemical surface-enhanced Raman scattering (E-SERS) is a powerful analytical technique that combines electrochemical measurements and in situ SERS spectroscopy. E-SERS extends the capability of conventional SERS via selective electrochemical enhancement of specific Raman signals, allowing multiplexed detection of biomolecules (e.g. uric acid) in complex environments. While recent advances in photonic technology has enabled handheld SERS spectrometers, the development of E-SERS sensors remains challenging due to the cumbersome fabrication of integrated plasmonic microchips.

This project aims to design and fabricate integrated E-SERS microchips for biosensing applications, which will synergise with other experimental effort led by the Lee group. In particular, E-SERS microchips will be achieved by a combination of photolithography and in situ electrodeposition that allows plasmonic nanostructures to be directly grown within a prefabricated microfluidic device, significantly simplifying the process. The project aims to pave the way towards on-the-spot diagnostics through robust multiplexed sensing of biomarkers in bodily fluids using a handheld standalone device.

Please visit the group website for more details about our research: http://tungchunlee.weebly.com/

The Candidate
The successful applicant should have or expect to achieve a first or upper second class Honours degree or equivalent in Chemistry, Physics, Materials Science, or a related discipline. The successful applicant will demonstrate strong interest and self-motivation in the subject, good experimental practice and the ability to think analytically and creatively. Good computer skills, plus good presentation and writing skills in English, are required. Previous research experience in contributing to a collaborative interdisciplinary research environment is highly desirable but not necessary as training will be provided. Knowledge in advanced data analysis using machine learning techniques is desirable.

Please contact Dr. Tung Chun Lee (tungchun.lee@ucl.ac.uk) for further details or to express an interest.

Applications will be accepted until 30 June 2019 but the position will be filled as soon as an appropriate candidate is found.