A 3.5-year PhD studentship in Programmable Conducting Polymer Nanocomposites for Printable Sensor Chips

Supervisors: Dr. Tung Chun Lee (UCL), Dr. Ming-Yong Han (IMRE, A*STAR)

Application deadline: 31 July 2019
Start Date: 23 September 2019
Location: London (1.5 years), Singapore (2 years)

Topics: nanomaterials design and synthesis, conducting polymers, supramolecular chemistry, sensing

The Studentship
This position is fully funded by the UCL-A*STAR Collaborative Programme via the Centre for Doctoral Training in Molecular Modelling and Materials Science (M3S CDT) at UCL. The student will be registered for a PhD at UCL where he/she will spend year 1 and the first six months of year 4. The second and third years of the PhD will be spent at the A*STAR Institute of Materials Research and Engineering (IMRE) in Singapore. The Studentship will cover tuition fees at UK/EU rate plus a maintenance stipend of about £16777 (tax free) pro rata in years 1 and 4. During years 2 and 3, the student will receive a full stipend directly from A*STAR. In addition, A*STAR will provide the student with one-off relocation allowance. Please note that, due to funding restrictions, only UK/EU citizens are eligible for this studentship.

The Project
Conducting polymers (CPs) are a unique type of organic materials that exhibit electrical and optical properties similar to those of inorganic semiconductors or, in selected cases, metals. Classical CPs, e.g. polythiophene, are intrinsically water-insoluble and difficult to functionalise, hindering their applications in biomedical applications. Conventional approach of introducing water-solubility and bespoke functional groups to CPs often involves functionalisation of monomers prior to polymerisation which is cumbersome and challenging to perform.

This PhD project aims to design and synthesise stimuli-responsive, multifunctional CP systems for biosensing and nanophotonic applications, which will synergise with other experimental effort led by the Lee group. In particular, highly fluorescent and biocompatible PC nanocomposites will be achieved by engineering the combinatorics of pendant functional groups on the polymer chains which is only possible via a mix-and-match supramolecular approach developed by our group. The project aims to pave the way towards modular design of aqueous CP nanocomposites for printable electronics and sensor chips for biomedical applications.

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 1st or 2:1 class Integrated Masters degree (MSci, MChem, etc.) or 2:1 minimum BSc plus stand-alone Masters degree with Merit 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.

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

Applications will be accepted until 15 July 2019 but the position will be filled as soon as an appropriate candidate is found.