

PhD Studentship

London Centre for Nanotechnology
University College London

PhD Studentship in Precise Nanomedicines guided by Super-Resolution Imaging

UCL EPSRC DTP award

Applications are invited for a fully funded EPSRC DTP PhD Studentship to work under the supervision of Dr. Sabrina Simoncelli and Prof. Giuseppe Battaglia in the Department of Chemistry and London Centre for Nanotechnology at University College London.

The studentship will cover tuition fees at the Home rate, and an annual stipend of no less than £17,285 increasingly annually with inflation. The studentship is funded for 4 years on a full-time basis, or up to 8 years on a part-time basis. Part-time stipend figures are pro-rata.

The successful applicant is expected to start in September/October 2021.

Studentship Details

The candidate will participate in an exciting research programme alongside physical chemists, optics, and biologists experts to gain molecular insight into the different parameters that can be exploited to fine-tune selective T cell activation and apply it to the design of more effective nanomedicines.

T-cells are essential for human immunity, playing a central role in pathogen elimination and tumour surveillance. When they recognise a toxic substance, via the receptors on their surface, a cascade of chemical reactions instructs the cells on how to behave. T cells rely on a number of factors to shape immune responses, including ligand-receptor affinity, on- and off-rates of the interaction and number and local density of receptors expressed on the cell surface. Outstanding questions remain on how these mechanisms work, and on how researchers can harness this knowledge to engineer effective nanomaterials that can re-direct T cells towards disease causing cells. We will take advantage of recently developed quantitative super-resolution optical microscopy that enables 3D imaging with resolution in the range of 10 nanometres. This method will allow us to quantitatively characterise the molecular distribution of functional biomolecules, both, on the surface of T cells and on the surface of nanomaterials. We will use this information to further develop a theoretical framework that allows designing precise nanomedicines.

The project will be carried out jointly between [Dr. Sabrina Simoncelli's](#) and [Prof. Giuseppe Battaglia's](#) labs and it involves cross-disciplinary work including advanced optical microscopy (using start-of-the-art 3D super-resolution imaging techniques) and chemical (synthesis of nanomaterials), biophysical (protein-ligand interactions), and computational approaches (including advanced image analysis using machine learning).

Eligibility

Suitable candidates for this post should have, or expect to have, a first or upper-second class Honours undergraduate degree and/or a post-graduate masters qualification in Chemistry, Physics or a related discipline (Biochemistry, Materials Science, Engineering, etc.). A background in optics/photonics and

experience with programming (MATLAB, Python, etc.) would be advantageous. However, enthusiasm and willingness to learn, create and innovate is more essential than prior experience of the different techniques involved.

Applicants must meet the EPSRC eligibility conditions to be eligible for the award – in summary this typically means that applicants must have no restrictions on their right to live in the UK permanently and have been resident in the UK for three years immediately prior to the studentship commencing. There is limited flexibility to offer awards to those who don't meet the EPSRC eligibility criteria, however note that the award covers Home tuition fees only. Please see [EPSRC's](#) and [UKRI](#) websites for further details.

Apply

Interested candidates should submit a supporting statement, a full CV (including contact details for at least two academic referees) and a copy of transcripts to-date via the [PhD Portal](#).

The supporting statement should clearly state the name of the project you are applying for at the top, and outline your interest in and suitability for, researching the suggested topic. On the application form, you do not need to complete the "Layman Summary" question, please just indicate the name of the project in this section instead. Referees will be contracted separately, so you do not need to supply references at the point of application. You will need to tick the box on the PhD Portal application form indicating this.

Successful candidates will be invited to submit a formal application for admission to UCL.

The closing date for applications is **January 1st 2021** and interviews will be held in **January 12th 2021**. The project will commence in October 2021.

For informal enquiries or further information about the studentship please email s.simoncelli@ucl.ac.uk.