

PhD Studentship in Microfluidics Particle Discovery and Manufacture

The [Elani Group](#) in the [Department of Chemical Engineering](#) at Imperial College London welcomes applications for PhD studentships to conduct work in the area of Microfluidics Particle Discovery and Manufacture. This fully-funded scholarship is open to both home and international students, and covers stipend, tuition fees and consumables. The position is funded for 4 years with an October 2023 start. Applicants should hold or expect to obtain a First-Class Honours or a high 2:1 degree at Master's level (or equivalent) in a relevant Science or Engineering degree.

Project description

The production of self-assembled particles is of major interest to a wide range of industries, including the pharmaceutical, vaccine, chemical, food, and personal care sectors. Current approaches rely on one-by-one manufacture of different particle types based on rational design principles. In this project, we will establish a new paradigm based on high-throughput particle manufacture and discovery. We propose a pioneering microfluidic technology that will enable the automatic generation of vast nanoparticle libraries. This will allow us to manufacture hundreds of thousands of distinct particle types, with varied morphological, compositional and physico-chemical features. In doing so, we will lay the foundations of a blue-skies research area based on high-throughput particle discovery, and offer a paradigm shift to existing approaches. We will use soft-matter particles for mRNA delivery as a testbed to validate our system due to their tremendous potential as nanomedicines. Building particle libraries and seeing how composition is related to architecture and particle properties will allow us to build a rule book which explains how composition, form, and function are intertwined: a universal theory for self-assembled particulate materials.

Techniques and technologies you will be learning and developing include:

- Droplet microfluidics
- Soft matter particle design and characterisation
- Microfluidic tech development and instrumentation
- Coding
- Cell biology functional screens
- Therapeutic delivery technologies

This will be a multi-disciplinary project which, depending on the applicant's background and research interest, will span across one or more of molecular bioengineering, chemical biology, chemical engineering, soft matter, and microfluidics.

Getting in touch

If you are interested in applying, please send a CV and a motivation letter to Yuval at y.elani@imperial.ac.uk. Feel free to get in touch or visit my [group](#) and [personal](#) websites if you would like more information.