

PhD POSITION

INNATE IMMUNE BARRIERS TO EMERGING VIRUSES

Duration: 3.5-year funded position

Start date: October 2024

Hosted by: Dr Lucy Thorne, Lecturer in Molecular Virology, Section of Virology, Department of Infectious Disease, Imperial College London, South Kensington Campus.

Application Deadline: Friday 23rd February 2024, 5pm.

The Project

We have an exciting opportunity for a PhD student to join our team. In the Thorne Lab we study the interactions between emerging viruses and our frontline defence against infection, the intracellular innate immune system. This network of pathogen sensors and effector proteins acts as a universal surveillance and defence system, which all viruses must overcome to infect. Our goal is to understand how viruses do this and how this links to transmission, pandemic potential and pathogenesis. A key question for us is what makes pandemic viruses special in their ability to manage the innate immune system? This is key to understanding which viruses pose the most risk for future pandemics. Through studying virus-host interactions, we also aim to reveal novel opportunities for therapeutic intervention to limit virus replication and inflammation, and to use viruses as discovery tools to uncover new knowledge of cell biology and innate immune regulation.

We have discovered that SARS-CoV-2 emerged already armed with the ability to overcome the human innate immune system, and that the more transmissible variants of concern have evolved to get even better at this. SARS-CoV-2 now gives us a model to understand the underlying mechanisms and molecular features associated with pandemic virus emergence and evolution. This project will characterise the mechanism of one of SARS-CoV-2's key innate immune antagonist proteins, initially using a wide range of molecular virology techniques, transcriptomics, and proteomics, with scope to apply new relevant techniques as the project develops. We are looking for an enthusiastic and motivated student interested in virus-host interactions. We will train you in all relevant techniques and, more broadly, in all aspects of scientific research, supporting your personal and career development.

The Lab

We are a new, funded lab building a supportive team. We are based in a dynamic and diverse environment in the Department of Infectious Disease, and part of the wider Institute of Infection which brings together multidisciplinary researchers across infection and immunity at Imperial. You will have access to a wide network of national and international collaborators, and virology research consortia formed during the SARS-CoV-2 pandemic. Our lab has an active public engagement programme that is

central to our research approach and creates opportunities for development. Imperial provides a fantastic training environment for PhD students and early career researchers with opportunities and tailored courses to support scientific, personal and wider career development.

The project is expected to start October 2024.

How to apply

Please send your CV, a cover letter and details of two referees to lucy.thorne08@imperial.ac.uk by 5pm Friday 23rd February 2024.

In the cover letter please:

- Tell us what motivates you to do scientific research and pursue a PhD.
- Explain why you are interested in this project and our lab.
- Tell about your qualities, skills and any experience that has helped prepare you to start a PhD.

Student eligibility

The studentship is funded for 3.5 years and covers home tuition fees and a stipend commensurate with UKRI rates (currently £20,622 per annum).

Applicants must have, or expect to gain, the equivalent of a UK Upper Second class or higher undergraduate degree in a relevant subject, including (but not limited to) biology, biochemistry, virology, microbiology. A Masters degree is desirable but not required. Applicants are also required to meet Imperial College's English language requirements. Please see the following link:

<https://www.imperial.ac.uk/study/ug/apply/requirements/english/>

We welcome applications from all backgrounds and especially from those that are currently underrepresented within academic research.

We will ensure that individuals with disabilities are provided reasonable accommodation to participate in the job application or interview process, to perform essential job functions, and to receive other benefits and privileges of employment.

For further details on the role please contact: Dr Lucy Thorne,
lucy.thorne08@imperial.ac.uk.

References:

- Thorne et al. Evolution of Enhanced innate immune evasion by SARS-CoV-2. *Nature*, 2022. Feb;602(7897):487-495. doi: 10.1038/s41586-021-04352-y.
- Bouhaddou et al. SARS-CoV-2 variants evolve convergent strategies to remodel the host response. *Cell* 2023 Oct 12;186(21):4597-4614.e26. doi: 10.1016/j.cell.2023.08.026.

- Thorne et al. SARS-CoV-2 sensing by RIG-I and MDA-5 links epithelial infection to macrophage activation. EMBO, 2021 Aug 2;40(15):e107826. doi: 10.15252/embj.2021107826.
- Reuschl et al. Evolution of enhanced innate immune suppression by SARS-CoV-2 Omicron subvariants. Nature Microbiology. 2024 Jan 16.doi: 10.1038/s41564-023-01588-4.

More information on the Thorne lab research interests and activities can be found here: <https://www.imperial.ac.uk/people/lucy.thorne08>

The College is a proud signatory to the San-Francisco Declaration on Research Assessment (DORA), which means that in hiring and promotion decisions, we evaluate applicants on the quality of their work, not the journal impact factor where it is published. For more information, see <https://www.imperial.ac.uk/research-and-innovation/about-imperial-research/research-evaluation/>

The College believes that the use of animals in research is vital to improve human and animal health and welfare. Animals may only be used in research programmes where their use is shown to be necessary for developing new treatments and making medical advances. Imperial is committed to ensuring that, in cases where this research is deemed essential, all animals in the College's care are treated with full respect, and that all staff involved with this work show due consideration at every level.

<http://www.imperial.ac.uk/research-and-innovation/about-imperial-research/research-integrity/animal-research/>

Imperial College is committed to equality of opportunity, to eliminating discrimination and to creating an inclusive working environment. We are an Athena SWAN Silver award winner, a Stonewall Diversity Champion, a Disability Confident Employer and work in partnership with GIRES to promote respect for trans people.