

## **BBSRC DPhil Studentship in Use of normo-thermic perfused organs to profile PK and infection efficiency of novel viral gene therapy vectors. [Project 2023/04]**

*Department of Engineering Science, University of Oxford in collaboration with Oxford Biomedica*

**Application Deadline: Friday 9<sup>th</sup> December 2022 (12:00 midday GMT)**

**Project Start Date: October 2023**

### **Supervisors**

Primary Supervisor: Prof Constantin Coussios

Secondary Supervisors: Prof Robert Carlisle

### **About the Project**

Major barriers to effective gene therapy include rapid neutralisation in the blood stream, high Kupffer cell capture in the liver and low efficiency of target cell infection. Targeted genetic modification can generate lentiviral vector variants which may have the potential to overcome these barriers. However, without valid test systems with which to compare new variants, misleading data may result in unsuitable variants being prioritised for clinical development. Indeed, current pre-clinical models fail to adequately recapitulate the scale and physiology of human patients. Rodents are commonly used but are a particularly poor model, with a circulation rate 13x faster than humans, liver endothelial fenestrae gaps 30-60nm wider than in humans [Wisse,2008,GT], a blood volume and total mass 3000x lower than humans, and a very different history of virus pre-exposure and blood cell complement receptor profile [Carlisle,2009,Blood]. We are uniquely positioned to be able to provide a system, a normothermic perfusion device (NTPD), which can maintain human organs outside the body and permit their dosing with therapeutic agents. Continuous perfusion allows for blood and bile samples to be taken so that organ function/toxicity and viral vector pharmacokinetics can be defined, whilst sampling for virus genomes and transgene products by punch tissue biopsies taken at regular junctures can also track rates and levels of entry and integration. We propose that, in collaboration with Oxford Biomedica, we will use the NTPD to profile the PK of novel Lentiviral vector variants developed in Oxford Biomedica.

### **About the BBSRC Collaborative Training Partnership in Advanced Bioscience of Viral Products (ABViP)**

This PhD studentship is part of the Biotechnology and Biological Sciences Research Council (BBSRC) Collaborative Training Partnership (CTP) in Advanced Bioscience of Viral Products (ABViP). The [ABViP CTP](#) is a comprehensive, multidisciplinary training programme designed to deliver the next generation of bioscience leaders who will advance research on the underpinning bioscience of viral products for future gene therapies and vaccines. Led by Oxford Biomedica (OXB) and involving both UCL and the University of Oxford, CTP students will have access to a wide-ranging portfolio of training opportunities at the Partner sites including taught courses and case studies designed to complement the doctoral research. Students trained through the ABViP CTP will gain a holistic insight into the research and development activities required to develop the medicines of the future, with the ability to see the world of medicines development through both an academic and industrial lens. For more information about the ABViP CTP, please click on the following [link](#).

A webinar will be held on Thursday 16th November 2022 17.30 – 18.30 (GMT) which will introduce the ABViP Programme, introduce each of the projects and provide an opportunity to have your questions answered.

## About the Department

The research will be performed within the Institute of Biomedical Engineering (part of the Oxford University Engineering Sciences Department) in collaboration with Oxford Biomedica. The Institute of Biomedical Engineering (IBME) is an interdisciplinary technology-focused research institute located at the heart of the University of Oxford's Medical Sciences campus, with sites adjacent to the Churchill Hospital and the Nuffield Orthopaedic Centre. Established in 2008, the IBME offers a world-class venue for cross-disciplinary biomedical engineering research and postgraduate training, where engineers, scientists and clinicians work together within a single ecosystem on addressing unmet needs in the prevention, early diagnosis and treatment of major diseases and conditions. The Institute's core research missions are to develop novel medical devices, technology and systems capable of delivering substantial healthcare benefit, and to translate new engineering technologies into clinical practice.

## About Oxford Biomedica

Oxford Biomedica (OXB) is a pioneer of gene and cell therapy with a leading position in viral vector research and bioprocessing. Our mission is to deliver life-changing gene therapies to patients. OXB is an innovation and science focussed company which has developed a leading platform of novel technologies and capabilities. The OXB team provide design, development, bioprocessing and analytical development for gene-based medicines based on viral vectors, both for in-house products and for those developed with partner organisations. OXB has contract development and manufacturing organisation (CDMO) capabilities that support the development of novel gene-based medicines through all phases of clinical development to commercial manufacture. At Oxford Biomedica, we drive credible science to realise incredible results.

## Entry requirements

As a minimum, applicants should hold or be predicted to achieve the following UK qualifications or their equivalent: a first-class or strong upper second-class undergraduate degree with honours in a relevant discipline such as biology, biochemistry, or medicine, although those who have not achieved this level of qualification will be considered if they show strong performance in a master's course. A previous master's degree is not required.

We particularly welcome applicants from disadvantaged backgrounds, or via an unconventional career path. If you're unclear as to whether you are eligible, we would encourage you to apply regardless. You can also contact the project supervisor (see details below). To learn more about the policies in relation to diversity and inclusion at the University of Oxford, please [click here](#) for further information.

Informal enquiries should be addressed to Constantin Coussios or Robert Carlisle (E-mail [constantin.coussios@eng.ox.ac.uk](mailto:constantin.coussios@eng.ox.ac.uk), [robert.carlisle@eng.ox.ac.uk](mailto:robert.carlisle@eng.ox.ac.uk) ).

## Funding

This BBSRC CTP ABViP Studentship is available to UK and Overseas (including EU) students. Full maintenance (stipend & fees) is available to the UK and Overseas students for the duration of the four-year PhD. Note that up to a maximum of one fully funded studentship allocation is available for Overseas students across the Department. The annual tax-free stipend for the PhD studentship is £17,668 (estimated).

### English language requirements

If your education has not been conducted in the English language, you will be expected to demonstrate evidence of an adequate level of English proficiency. The English language level for this programme is: **Standard**

### Deadline and Application Process

The deadline for submission is 12:00 midday on Friday 9<sup>th</sup> December 2022

To apply for this PhD studentship, you must submit a formal application to the DPhil in Advanced Bioscience of Viral Products course (Course code RD\_NG1) through UOXFs application portal by the above deadline. More information about the course and application process is available here:

<https://www.ox.ac.uk/admissions/graduate/courses/dphil-advanced-bioscience-of-viral-products>