

BBSRC DPhil Studentship in Integrative analysis of metabolomics, transcriptomics and proteomics to study mechanisms that regulate lentiviral vector hepatocyte transduction [Project 2023/03]

Radcliffe Department of Medicine (NDCLS), University of Oxford in collaboration with Oxford Biomedica

Application Deadline: Friday 9th December 2022 (12:00 midday GMT)

Project Start Date: October 2023

Supervisors

Primary Supervisor: Dr Shijie Cai

Secondary Supervisors: Professor Steve Hyde

About the Project

Liver transplantation is the only cure for many congenital and acquired diseases. However, multiple liver diseases are thought to be single-gene disorders that may be amenable to gene therapy via targeting of liver hepatocytes. The liver, therefore, represents an important target organ for developing new gene therapy approaches.

One challenge is that hepatocytes are generally quiescent; thus a recombinant lentiviral vector (LV) may have the advantage over other gene transfer vectors in being able to transduce non-dividing cells, and also to integrate in the cell genome permitting long-term transgene expression. Crucially, irrespective of the specific application, establishing efficient LV transduction will be imperative for successful liver gene therapy.

The specific focus of this project will be to study potential effects of LV transduction on cellular metabolism and signalling pathways in liver cells. Whereas transcriptomics and proteomics measure changes in genes and proteins, respectively, metabolomics allows the concurrent measurement of large numbers of cellular metabolites. Machine learning can be used to integrate data generated from all three technologies, and will be used to determine large-scale changes induced by the virus aiming to identify novel targets, pathways and mechanisms that affect/regulate efficient gene transfer in hepatocytes.

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 Radcliffe Department of Medicine (RDM) is a large multi-disciplinary Department which aims to tackle some of the world's greatest health challenges by integrating innovative basic biology with cutting edge clinical research. Within RDM, the Nuffield Division of Clinical Laboratory Sciences (NDCLS) is focused on the pathology of human disease and gene and cell therapy approaches are being explored to translate our findings into new treatments.

We also provide training to medical students, trainees and fellows in the areas of clinical laboratory science through internationally acclaimed training programmes. Ultimately, through the combination of these and our close collaborations with clinical colleagues in other University and NHS departments we strive to deliver excellence in medical diagnosis and care to patients.

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 Dr Shijie Cai E-mail: shijie.cai@ndcls.ox.ac.uk or Professor Steve Hyde steve.hyde@ndcls.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 9th 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>