

# **PhD Studentship: Dissecting the immunosuppressive effects of Marek's disease virus**



**Project Ref:** 2022/07/SB

**Anticipated Start Date:** July 2022

**Duration:** 3.5 years full-time

**Closing date to apply:** 30.01.22



## **Eligibility:**

- This studentship is open to science graduates (with, or who anticipate obtaining, at least a 2:1 or equivalent, in a relevant biological subject in their undergraduate degree, or a Masters degree - subject to university regulations). Other first degrees, e.g. veterinary science, will be considered. You should be looking for a challenging, interdisciplinary research training environment and have an active interest in the control of infectious diseases.
- This is a 3.5 year fully-funded studentship open to UK nationals. EU and international applicants are welcome to apply, however international university tuition fees will apply and these are not included in the funding – please see funding information below.
- Students without English as a first language must provide evidence that they meet the English language requirement, e.g. with an average IELTS score of 7.0, with no lower than 7.0 in listening/reading and no lower than 6.5 in speaking/writing.

## **Supervision:**

**Principal Supervisors:** [Dr Shahriar Behboudi](#) (The Pirbright Institute), [Dr Natalie Riddell](#) (University of Surrey)

**Co-Supervisors:** Dr Ajit Patil (The Pirbright Institute)

## **Project Details:**

Oncogenic viruses have evolved various mechanisms to escape immune control and promote tumour development. One such mechanism is the activation of pathways leading to metabolic changes that can influence physiological and immunological activities in the infected individuals; in some viral infections this manifests itself as the production of Prostaglandins which manipulate immunological responses against both viruses and tumours.

Our group has shown that Marek's disease virus, an avian oncogenic virus, induces the expansion of novel regulatory T cells in infected chickens, and this may explain the immunosuppression observed in these birds (Gurung et al. PLoS Pathogen 2017). We have also shown that Marek's disease virus activates metabolic changes (Boodhoo et al. Journal of Virology 2019, Boodhoo et al. Journal of Virology January 2020, Boodhoo et al. Journal of Virology September 2020), including the production of Prostaglandins. Marek's disease virus expresses over 80 different viral proteins in the infected cells. Based on this information, the PhD candidate will use *in vitro* systems to identify the gene(s) of Marek's disease virus which activate regulatory T cells via induction of Prostaglandins.

The student will join a successful, motivated multidisciplinary team with expertise in cellular and molecular immunology, virology, and metabolism. A combination of cellular and molecular immunology as well as classical virology techniques including flow cytometry, confocal microscopy, metabolic analysis, molecular biology, and gene silencing will be utilised in this project.

## **References for Background Reading:**

1. Boodhoo N, Gurung A, Sharif S, Behboudi S. Marek's disease in chickens; a review with focus on immunology. *Veterinary Research*, 2016 November 28: 47(1);119.
2. Gurung A, Kamble N, Kaufer B, Pathan A, Shahriar Behboudi. Association of Marek's Disease induced immunosuppression with activation of a novel regulatory T cells in chickens, *PLoS Pathogens*, 2017, 13 (12), e1006745.
3. Boodhoo N, Kamble N, Kaufer BB, Behboudi S. Replication of Marek's disease virus is dependent on de novo synthesis of fatty acid and Prostaglandin E2. *J Virol*. 2019 Jun 14;93(13).
4. Boodhoo N, Kamble N, Sharif S, Behboudi S. Glutaminolysis and Glycolysis are essential for optimal replication of Marek's disease virus. *J Virol*. 2020 Jan 31;94(4).
5. Boodhoo N, Kamble N, Behboudi S. De Novo Cholesterol Biosynthesis and Its Trafficking in LAMP-1 Positive Vesicles Are Involved in Replication and Spread of Marek's Disease Virus, *J Virol*. 2020 Sep. *In press*.

**Registration, Training and Funding:**

This is a Pirbright Institute/University of Surrey fully funded studentship. All students are eligible for the full award (stipend and **home rated** university tuition fees). **EU and International students will be liable for tuition fees at the international rate and must be able to fund the difference between “Home” and “Overseas” tuition fees themselves. For Home student eligibility guidelines, please refer to the [UKRI Full Eligibility Criteria \(Annex One\)](#).**

The student will be based primarily at The Pirbright Institute and registered with the University of Surrey. The student will visit the university to meet with their supervisors and undertake training or complete specific project tasks as required. Eligible students will receive a minimum annual stipend of £15,609 plus a cost of living top-up allowance of £2,200 per annum. Home rated university registration fees will be paid. Highly subsidised student housing will be offered. A full range of research and transferrable skills training will be made available to the student as appropriate.

**Applications:**

[How to Apply](#): **Closing date 30.01.22**

Essential documents:

- Application Form
- CV
- Two references sent directly by your referees

Please email your application to [studentship@pirbright.ac.uk](mailto:studentship@pirbright.ac.uk) by the closing date.