

PhD Studentship:

Recombinant pseudorabies virus as a multivalent vectored vaccine platform for emerging and endemic porcine diseases

Project Ref: 2020/03/SG/DW

Anticipated Start Date: October 2020 **Duration:** 3.5 years full-time

Closing date to apply: 07.02.20

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 fully-funded studentship only open to UK students and eligible EU students who qualify for home-rated fees, in line with [Residential Eligibility Guidelines for Studentships](#).
- Students without English as a first language must provide evidence that they meet the English language requirement, e.g. with an IELTS score of 7.0 and no less than 6.5 in any of the subsections.

Supervision:

Principal Supervisors: Prof Simon Graham (The Pirbright Institute), Prof Dirk Werling (Royal Veterinary College)

Co-Supervisors: Dr Jane Edwards (The Pirbright Institute)

Industrial Contact: Prof Thomas Mettenleiter (Friedrich-Loeffler-Institut (FLI), Germany)

Project Details:

Pseudorabies virus (PrV), the causative agent of the Aujeszky's disease, is responsible for substantial losses to the expanding pig industry in Southeast Asia. Control and eradication of SuHV-1 in many western countries was aided by the development of highly efficacious live attenuated vaccines, including genetically modified strains capable of differentiating infected from vaccinated animals. Southeast Asian pig producers are also significantly impacted by other viral pathogens, including porcine reproductive and respiratory syndrome viruses (PRRSV). Pigs in these countries are also at risk from 'spillover' infection with the zoonotic Nipah virus (NiV), which devastated the Malaysian pig industry with long lasting effects. Compared to single disease vaccines, the use of bi/multi-valent vaccines in the livestock industry is more desirable, particularly in resource poor contexts. We hypothesise that live attenuated PrV may be genetically engineered to express antigens from NiV and/or PRRSV and this recombinant virus could serve as a potent bi/multi-valent vaccine.

This project aims to test this hypothesis and take the key first steps towards the development of bi/multivalent PrV vectored vaccines for NiV and PRRSV. The project will address this through the following specific objectives:

1. To genetically engineer live attenuated PrV expressing NiV and PRRSV antigens, either individually or in combination
2. To characterise recombinant PrV vectors *in vitro* by assessment of growth kinetics, transgene expression and antigenicity.
3. To demonstrate the immunogenicity of recombinant PrV vectors *in vitro* by assessing responses of porcine conventional and plasmacytoid dendritic cells.
4. To evaluate the immunogenicity/efficacy of recombinant PrV vectors in pigs (Dependent upon securing additional funding/support).

References for Background Reading:

1. www.pirbright.ac.uk/our-science/livestock-viral-diseases/porcine-reproductive-and-respiratory-syndrome-prrs-immunology
2. McLean RK, Graham SP. 2019. Vaccine development for Nipah virus infection in pigs. *Frontiers in Veterinary Science* 6:16.

3. Freuling CM, Müller TF, Mettenleiter TC. 2017. Vaccines against pseudorabies virus (PrV). *Veterinary Microbiology* 206:3-9.
4. Nan Y, Wu C, Gu G, Sun W, Zhang YJ, Zhou EM. 2017. Improved Vaccine against PRRSV: Current Progress and Future Perspective. *Frontiers in Microbiology* 8:1635.

Registration, Training and Funding:

This is a Pirbright Institute/RVC fully funded project. The student will be based primarily at The Pirbright Institute and registered with the RVC. The student will visit the university to meet with their supervisors and undertake training or complete specific project tasks as required. In addition, the student will be required to spend a period of 6-12 months at FLI, Germany. Eligible students will receive a minimum annual stipend of £15,009 plus a cost of living top-up allowance of £2,200 per annum. University registration fees will be paid. A full range of research and transferrable skills training will be made available to the student as appropriate.

Applications:

Closing date to apply: 07.02.20

[Click here for details of how to apply](#)

Essential documents:

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

Please email your application to studentship@pirbright.ac.uk by the closing date.