

PhD Studentship: Spatiotemporal pathogen-host interactions during African swine fever virus infection



Closing date: 12.04.19
Project Ref: 2019-13 CN/CB
Anticipated Start Date: October 2019
Duration: 3.5 years full-time

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 Guidelines for Research Council 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: Dr Chris Netherton (The Pirbright Institute), Dr Camilla Benfield (Royal Veterinary College)
Co-Supervisors: Dr Raquel Portugal, Prof Pippa Hawes (The Pirbright Institute)
Friedrich-Loeffler-Institut (FLI) contacts: Dr Axel Karger, Prof Thomas Mettenleiter

Project Details:

African swine fever virus causes a severe disease of domestic pigs that is spreading at an alarming rate throughout Europe and China. Little is known about the interactions between ASFV and host proteins during infection including that of the cellular receptor used for ASFV entry. The Pirbright Institute has set up stimulated emission depletion (STED) super resolution microscopy as a tool to study African swine fever virus replication and propose to combine this with the Friedrich-Loeffler-Institut's expertise in proteomics to gain a detailed understanding of the virus-host interactions of key viral proteins.

The successful applicant will generate recombinant viruses encoding proteins fused to tags suitable for spatiotemporal analysis by super resolution microscopy (Eckhardt, 2011) and affinity purification and mass-spectrometry (AP-MS; Gerold, 2016). These viruses will then be used to study the localisation of tagged viral proteins in live cells over time using super resolution microscopy and identify key events such as the formation of the viral replication sites or entry into the host cell. Viral and cellular host interacting partners at different time points will then be identified by AP-MS at Friedrich-Loeffler-Institut and further analysed at Pirbright.

This approach will lead to a greater understanding of the cellular factors involved in formation of African swine fever virus replication complexes and entry into the host cell. It will also represent a proof-of-principle to study the interactions of any of the 150 ORFs encoded by African swine fever virus. The successful applicant will work in the African swine fever vaccinology group at Pirbright and be registered with Camilla Benfield at the Royal Veterinary College. The lab work will take place in the high containment laboratories at The Pirbright Institute with a six to twelve month placement at the Friedrich-Loeffler-Institut near Griefswald, Germany.

References for Background Reading:

1. Eckhardt M, Anders M, Muranyi W, Heilemann M, Krijnse-Locker J, Müller B. (2011) A SNAP-tagged derivative of HIV-1--a versatile tool to study virus-cell interactions. PLoS One. 6(7):e22007. doi: 10.1371/journal.pone.0022007
2. Gerold G, Bruening J, Pietschmann T. (2016) Decoding protein networks during virus entry by quantitative proteomics. Virus Res. 218:25-39. doi: 10.1016/j.virusres.2015.09.006.

3. Keßler C, Forth JH, Keil GM, Mettenleiter TC, Blome S, Karger A (2018) The intracellular proteome of African swine fever virus. *Sci Rep.* 8(1):14714. doi: 10.1038/s41598-018-32985-z.

Registration, Training and Funding:

This is a fully funded collaborative project between The Pirbright Institute, the RVC and FLI. The student will be based at The Pirbright Institute and registered with the RVC, with visits to the university to meet with their supervisor and undertake training 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 and 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:

Details of how to apply can be found here: [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 noted above.