

Project Title: The role of *Stomoxys* biting flies in African swine fever virus transmission

Supervisors: [Dr Raquel Portugal](#), [Dr Chris Netherton](#), [Dr Christopher Sanders](#)

Research groups: [ASFV Group](#), [ASF Vaccinology](#), [Entomology](#)

Project Summary: ASFV causes a contagious and typically fatal disease that affects domestic and feral swine. It has caused many large outbreaks around the world in recent years, notably in Eastern Europe and Asia. There is no approved vaccine available and disease control relies on the quarantine and culling of infected and exposed swine.

Transmission of ASFV is primarily through direct contact between infected animals and the consumption of infected pork products. Soft ticks are also vectors for ASFV in Sub-Saharan countries and in the Iberian peninsula in the past, but the role of other potential vectors still lacks elucidation. This project aims to investigate the role of biting flies (*Stomoxys sp.*) in ASFV transmission, which could be relevant in transmission in different areas of the world.

The project will directly support the DEFRA funded project “Vaccines, diagnosis and epidemiology for control and prevention of African swine fever”. At present it is unclear if biting flies take up virus from infected animals and if so, how long this virus is stable for. This project will run in parallel with animal experiments for immunisation trials in Pirbright and the student can be involved in different sections of the experiment and collection/processing of samples. This will involve training in different lab techniques to study infectivity in flies, namely qPCR and haemadsorption assay on cultured macrophages. Results will be compared with others obtained after artificial feeding of *Stomoxys* flies.

Further Details: Training on ASFV will be provided by Raquel Portugal and Chris Netherton while training on handling *Stomoxys* flies will be provided by Christopher Sanders. The student will be trained to work in high containment facilities and will gain experience in cell culture and virological techniques, qPCR, and working with biting flies in containment. The laboratories are based in a multi-user lab shared with the African swine fever virus, Large DNA virus and Mucosal Immunology groups, hence providing further knowledge exchange opportunities for the student.

References for Suggested Reading:

Olesen AS, Lohse L, Hansen MF, Boklund A, Halasa T, Belsham GJ, Rasmussen TB, Bøtner A, Bødker R. Infection of pigs with African swine fever virus via ingestion of stable flies (*Stomoxys calcitrans*). *Transbound Emerg Dis*. 2018 Oct;65(5):1152-1157. doi: 10.1111/tbed.12918. Epub 2018 Jun 7. PMID: 29877056.

Olesen AS, Hansen MF, Rasmussen TB, Belsham GJ, Bødker R, Bøtner A. Survival and localization of African swine fever virus in stable flies (*Stomoxys calcitrans*) after feeding on viremic blood using a membrane feeder. *Vet Microbiol*. 2018 Aug;222:25-29. doi: 10.1016/j.vetmic.2018.06.010. Epub 2018 Jun 19. PMID: 30080669.

Olesen AS, Belsham GJ, Bruun Rasmussen T, Lohse L, Bødker R, Halasa T, Boklund A, Bøtner A. Potential routes for indirect transmission of African swine fever virus into domestic pig herds. *Transbound Emerg Dis*. 2020 Jul;67(4):1472-1484. doi: 10.1111/tbed.13538. Epub 2020 Mar 23. PMID: 32150785.

Netherton CL, Connell S, Benfield CTO, Dixon LK. The Genetics of Life and Death: Virus-Host Interactions Underpinning Resistance to African Swine Fever, a Viral Hemorrhagic Disease. *Front Genet*. 2019 May 3;10:402. doi: 10.3389/fgene.2019.00402. PMID: 31130984; PMCID: PMC6509158.

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Please email your CV (no more than two sides of A4) and a covering letter, detailing why you would like to undertake the placement and the knowledge and skills that you will bring to the Institute, to studentship@pirbright.ac.uk.

Closing date to apply: 09.00, 7th February 2022