PhD Studentship: Enhancing Insight into Variations in Virulence Among Avian influenza Viruses Infecting Poultry

Project Ref: 2024/10
Anticipated Start Date: October 2024 **Duration:** 3.5 years full-time
Closing date to apply: 30.04.24

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 Master's 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. International applicants are welcome to apply, however overseas university tuition fees are **not included** in the studentship funding – 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: Prof Munir Iqbal (The Pirbright Institute), Prof Janet Daly (University of Nottingham).

Co-Supervisors: Dr Jiayun Yang (The Pirbright Institute), Prof Stephen Dunham (University of Nottingham).

Research Group: **Avian Influenza and Newcastle Disease**

Project Details:

The avian influenza viruses (AIVs) present an escalating risk to poultry and human health as they overcome species barriers. AIVs continue to circulate in wild birds and infect domesticated poultry, threatening global food security and posing significant zoonotic risk. The genetic evolution results in substantial variation in disease severity, antigenic diversity, and vaccine failure, with substantial socioeconomic consequences. Therefore, our project is dedicated to identifying genetic markers responsible for changes in virulence, transmission, host range, and vaccine failure.

This research will aid global control strategies by improving our predictive capabilities to enhance our response to emerging threats and improve the efficacy of vaccines. More importantly, the outcome of this project aims to reach those in the poultry value chain, protecting food security and safeguarding economies.

Key Objectives:

- **Identify Genetic Markers:** Investigate genetic sequences of contemporary viruses to identify motifs linked with disease severity and/or vaccine failure.
- **Utilise advanced molecular biology approaches. e.g. Reverse Genetics:** Identify the molecular markers that impact virus phenotypic behaviour.
- **Investigate Virulence Mechanisms:** Identify the molecular pathways modulating virus virulence and cross-species transmission.
- **Develop new disease mitigation approaches:** Develop innovative approaches to analyse viral diversity, evaluate markers of vaccine failure, and design more effective vaccines.

Join our multidisciplinary effort to achieve a comprehensive understanding and develop effective strategies against AIV. Through this project, students will forge new methodologies and insights, contributing significantly to advancements in disease management and prevention. This initiative is crucial for protecting poultry, public health, and ensuring food security.

References for Background Reading:

1. Carter T, Iqbal M. The Influenza A Virus Replication Cycle: A Comprehensive Review. Viruses. 2024 Feb 19;16(2):316. https://doi.org/10.3390/v16020316.
2. Peacock TP, Sealy JE, Harvey WT, Benton DJ, Reeve R, Iqbal M. 2021. Genetic Determinants of Receptor-Binding Preference and Zoonotic Potential of H9N2 Avian Influenza Viruses. J Virol 95:10.1128/jvi.01651-20. https://doi.org/10.1128/jvi.01651-20.
3. Bhat S, James J, Sadeyen J, Mahmood S, Everest HJ, Chang P, Walsh SK, Byrne AMP, Mollett B, Lean F, Sealy JE, Shelton H, Slomka MJ, Brookes SM, Iqb al M. 2022. Coinfection of Chickens with H9N2 and H7N9 Avian Influenza Viruses Leads to Emergence of Reassortant H9N9 Virus with Increased Fitness for Poultry and a Zoonotic Potential. J Virol 96:e01856-21. https://doi.org/10.1128/jvi.01856-21.
4. Peacock TH, James J, Sealy JE, Iqbal M. A global perspective on H9N2 avian influenza virus. Viruses. 2019 Jul 5;11(7):620. https://doi.org/10.3390/v11070620.
5. Shrestha, A., Meeuws, R., Sadeyen, JR. *et al.* Haemagglutinin antigen selectively targeted to chicken CD83 overcomes interference from maternally derived antibodies in chickens. *npj Vaccines* 7, 33 (2022). https://doi.org/10.1038/s41541-022-00448-2.

Registration, Training and Funding:

This is a Pirbright Institute/University of Nottingham fully funded studentship. All students are eligible for the full award (stipend and **home rated** university tuition fees). **International students will attract tuition fees at the overseas rate and must therefore have the means 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 B)**.

The student will be based primarily at The Pirbright Institute and registered with the University of Nottingham. 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 UKRI-aligned stipend (minimum £18,622 for 2023/24) plus a cost-of-living top-up allowance of £2,200 per annum. Home rated university tuition fees will be paid. Highly subsidised Pirbright Institute 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: 30.04.24

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.