Department of Veterinary Medicine

Available PhD Project:

**Supervisor:** Professor Clare Bryant

**Supervisor profile page:** [https://www.research.vet.cam.ac.uk/research-staff-directory/principal-investigators/infection-and-immunity/clare-bryant](https://www.research.vet.cam.ac.uk/research-staff-directory/principal-investigators/infection-and-immunity/clare-bryant)

**Project Title:** The role of Trif in Toll-like receptor 4 signaling

**Description:** Toll-like receptor 4 (TLR4) is a Pattern Recognition receptor that recognises Gram negative bacteria, but also proteins released by tissue damage and misfolded proteins to activate innate immunity and drive inflammation. TLR4 signals through two pathways MyD88- and Trif-dependent. Trif signalling is important for generation of type I interferon production which is important for host protection against infection but also for successful activity of many adjuvants. The structure of signalling complexes formed by MyD88 are well understood, but those formed by Trif and how this impacts on the signalling responses generated when TLR4 is activated are unclear. In this project the student will use a range of microscopy and cell biology techniques to determine the importance of Trif in TLR4-induced cell signalling and to determine the molecular nature of Trif signalling complexes in response to bacterial lipids and misfolded protein aggregates (beta amyloid). The research involves cutting edge microscopy techniques through cross-disciplinary collaborations so much of the work will be performed in collaboration with the research groups of Pietro Cicuta (Physics) and David Klenerman (Chemistry). At the end of this PhD project the student will have obtained practical skills (cell culture, cell signalling assays, microscopy, data analysis), analytical skills and written skills in innate immunology.

**References**


**Funding:**
This project is not funded. Prospective students would be expected to apply for funding opportunities either through the University ([http://www.vet.cam.ac.uk/grad/Prospectivestudents/funding](http://www.vet.cam.ac.uk/grad/Prospectivestudents/funding)) or other sources.

**How to apply:**
Contact the Supervisor to discuss before submitting an application.
More details on how to apply here: [http://www.vet.cam.ac.uk/grad/Prospectivestudents/apply](http://www.vet.cam.ac.uk/grad/Prospectivestudents/apply)