Available PhD Project:

**Supervisor:** Dr Frances Henson

**Supervisor profile page:**
https://www.research.vet.cam.ac.uk/research-staff-directory/principal-investigators/systems-pathology/Frances-Henson

**Project Title:** The role of the inflammatory system in healing joint surface defects in a large animal model

**Description:** Joint surface defects occur either in the cartilage (“chondral” defects) or develop in the cartilage and underlying bone (“osteochondral” defects) and, if left untreated, can cause osteoarthritis. Osteochondral defects have healing capacity if they are small and are believed to heal by recruiting nondifferent, bone marrow–derived stromal/stem cells contained in the bone marrow into the damaged site. In contrast, chondral defects have a poor intrinsic healing capacity. Treatment strategies to heal chondral defects often utilize the bone marrow–derived stromal/stem cell population by accessing the bone marrow through microfracture techniques, which provide cost-effective and functional healing in many cases. Work in our group has recently described the mechanism by which these joint surface defects heal in large animal models. However, many questions remain unanswered, particularly regarding the role of the immune and inflammatory systems in the repair and regeneration of the cartilage and its surrounding tissues. The aim of this studentship is to explore the role of inflammation in the healing of joint surface defects in sheep.

The student will use a combination of approaches to study this research question including immunohistochemistry techniques to investigate the inflammatory processes within archived samples of healing joints defects, tissue culture techniques to characterise the effects that inflammatory cells have on musculo-skeletal tissues and standard protein biochemistry/molecular biology techniques to examine cellular responses.

The student will learn experimental design, data collection, storage, interpretation and presentation. In addition the student will learn laboratory based techniques including immunohistochemistry, histology, tissue culture, cell migration assays, Western blotting and qPCR. Transferable skills that will be learnt include record keeping, methodical methods of work, inter-personal skills and presentation skills.

**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) 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