Available PhD Project:  
**Supervisor:** Paul Freeman, Kate Hughes  
**Supervisor profile pages:** Paul Freeman, Kate Hughes

**Project details:** **Canine intervertebral disc disease; how much do we know?**

The pathogenesis of canine intervertebral disc disease is poorly defined and there are currently no robust criteria to distinguish patients that unequivocally require surgery from those which will recover whilst receiving conservative medical management. The project aims to study aspects of canine intervertebral disc disease to provide answers to some of the unknowns, by focusing on three research questions:

1. Can dogs rendered non-ambulatory following acute compressive thoracolumbar intervertebral disc herniation (TL IVDH) recover ambulation without decompressive surgery?
2. By what mechanism is herniated intervertebral disc material removed by natural processes from the vertebral canal in dogs treated conservatively for TL IVDH?
3. Is recovery of ambulation and/or speed of recovery associated with removal of extruded disc material from the vertebral canal?

In addition we will be aiming to explore the data to ask several further questions which may aid decision-making when it comes to dealing with this common neurological disease of dogs. The candidate should have a good working knowledge of canine neurology, and be happy to interact with clients and referral veterinary surgeons, since this part of the study will involve real cases. Advanced imaging techniques and interpretation will be taught during the course of the study.

Further to this, we would like to look at the inflammatory profile of extruded disc material from both the cervical and thoracolumbar regions removed during decompressive surgical procedures, using a combination of histopathological analyses, ELISA, and other molecular biology techniques. We will also compare the inflammatory profile of material removed from non-herniated discs at prophylactic fenestration, in order to assess whether there is a difference which may help to explain why some discs herniate and other do not. We also aim to culture as many samples of extruded material as possible, since there has been some recent evidence that human disc herniation may be predisposed by bacterial infection. The candidate will be taught the necessary laboratory techniques to enable them to carry out this part of the study with the help of on-site members of staff. Finally we have the possibility to use both a pressure sensor matt (Tekscan) as well as a treadmill based system to analyse the gait of dogs which are presented with IVDH, as well as to monitor their recovery and potentially compare different treatment methods. There is currently a small amount of published work in the veterinary literature, and this is a field which is developing rapidly since it provides an opportunity for more objective testing of treatment protocols. We have an existing pilot study underway where we are specifically looking to evaluate the usefulness of the simpler to use “Tekscan” pressure matt, and we hope to extend this to further characterise the gait profile of dogs suffering with IVDH as well as to monitor their recovery in an objective way. The candidate will be taught all necessary skills to perform these analyses.

**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)