Department of Veterinary Medicine

Available PhD Project:

Supervisor: Dr Eleanor Raffan
https://www.research.vet.cam.ac.uk/research-staff-directory/principal-investigators/systems-pathology/Eleanor-Raffan

Co-Supervisor: Dr David Sargan
https://www.research.vet.cam.ac.uk/research-staff-directory/principal-investigators/systems-pathology/David-Sargan

Project Title: Using canine models of obesity to discover the mechanisms by which genes influence obesity.

We are interested in discovering the mechanisms by which genes influence obesity. The dog is an excellent model organism for human comparative analyses. They have a similar gene set to humans and selection bottlenecks mean that mapping even complex diseases is tractable with fewer markers and individuals than in humans. We have already successfully mapped obesity-associated loci in two dog breeds.

There are two potential projects available, one with a bioinformatics/genomics focus (and some bench work) and the other primarily bench based (with some accessible bioinformatics). Each is allied to the basic workflow described below, the former focussing on 1-3 and the latter focussed on part 4. Samples for GWAS are already collected, and previously run GWAS provide material for those who prefer the 'follow-on' functional work.

We use comparative genomics and molecular techniques to identify obesity-associated genes 1) using genome wide association studies to determine obesity loci within and across dog breeds, 2) applying a comparative genomics approach to prioritise loci of relevance in both humans and dogs, 3) using next generation sequencing to identify canine mutations at priority loci, 3) interrogating the importance and function of those prioritised genes/mutations in other canine and human populations, 4) testing the consequences of discovered canine mutations on gene expression or cellular assays.

This PhD will offer training in both dry and wet lab genetics and genomics/molecular biology, with scope to focus on areas of your particular interest. You would learn to use a range of genomics/bioinformatics tools, 'wet lab' genetics techniques (DNA and RNA extraction, sequencing, RTqPCR etc) and/or molecular biology skills (e.g. cell culture, western blotting, luciferase assays). Feel free to contact Eleanor Raffan er311@cam.ac.uk if you have any questions.

Project will be physically based at the Institute of Metabolic Science - http://www.ims.cam.ac.uk/

Funding:
This project is for self-funded students. Students who apply on time may be entered into the University Graduate Funding Competition - see here for more info on funding:
https://www.vet.cam.ac.uk/study/postgrad/funding

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