



PhD student recruitment

PhD topic: Characterisation of clinical, biochemical and metabolomic biomarkers in cats during the ageing process.

Supervisor(s): Alex German (University of Liverpool), Eithne Comerford (University of Liverpool), Anne McArdle (University of Liverpool), and Arief Gusnanto (*University of Leeds*)

Closing date for applications: 28th February 2021

Stipend: £23,592 - 24,545 tax-free stipend (veterinary graduate only)

Project description

The Royal Canin Feline Healthy Ageing Clinic is an initiative that aims to promote the health and wellbeing of older cats. To date, over 200 cats have been recruited, and return every 6-12 months for monitoring of a range of clinical parameters, continuing until the end of the cat's natural lifespan. Assessments include regular health checks and various clinical assessments including quality of life, photography, dental assessment, muscle ultrasound, gait analysis, and a physical activity check. Blood, urine and faeces are also regularly collected for health screening, with surplus material being sorted in a well-profiled biobank.

During a recent PhD project, the initial outcomes of this cohort was described (Dowgray 2021, PhD thesis). The aim of the current project will be to extend the analysis of epidemiological and clinical data, in conjunction with measurement of various biomarkers in clinical samples. Proposed biomarkers would include urinary creatinine, inflammatory cytokines, plasma indices of sarcopenia and clinical markers of neuromuscular dysfunction. Where appropriate, the analysis will be augmented with metabolomic analysis of plasma and urine samples. Cats will be stratified based on clinical outcomes (i.e., mobility, QOL, disease status etc). Advanced multivariate statistical modelling will then be used to identify profiles of cytokines and other factors (muscle function, clinical parameters) associated with clinically groupings. Such techniques have recently been used by supervisors to investigate Myalgic Encephalomyelitis (ME) /Chronic Fatigue Syndrome (CFS) in people (Gusnanto et al, submitted) and appropriate training will be provided.



Proposed outputs include development of predictive tools that can be used clinically (identifying those at risk of health consequences in the future) +/- identifying novel targets for intervention, possibly, through nutrition. These clinical and biomarker analyses will be augmented by a detailed metabolic profiling of cats as they age, making use of plasma and urine samples from the biobank. The longitudinal profile of cats as they age will be related to changes in physiological, visual and clinical characteristics. In addition, we would explore differences in the metabolome of different phenotypic groups of cats using advanced data analysis as outlined above. **The successful student will be a qualified veterinary surgeon (either MRCVS or eligible) and will use their existing veterinary experience to assist with clinical monitoring of the cohort.** They will receive training in epidemiology, statistics and relevant laboratory techniques.

- O1. Continue the longitudinal monitoring of a cohort of ~200 pet cats during their ageing process.
- O2. Determine clinical, biomarker (including cytokine) and metabolomic profiles of mature cats, and how these change during the ageing process.
- O3. Undertake statistical and mathematical analysis of these datasets to identify specific disease groupings, and determine effects of various clinical variables
- O4. Undertake preliminary clinical validation studies to determine if the clinical parameters, biomarkers and the metabolites identified in Objectives 2 and 3 can be used to predict outcomes in ageing cats.

The Institute of Life Course and Medical Sciences is fully committed to promoting diversity and gender equality in all activities. In recruitment we emphasize the supportive nature of the working environment and the flexible family support that the University provides. The Institute holds a silver Athena SWAN award in recognition of on-going commitment to ensuring that the Athena SWAN principles are embedded in its activities and strategic initiatives.



Funding notes and any specific eligibility requirements:

The funding is through a grant from Royal Canin **for full-time VETERINARY SURGEON (MRCVS or MRCVS-eligible)** to undertake a 3-year PhD. The stipend is tax-free. Although no laboratory skills are required, they would be beneficial. This may be from studentships undertaken whilst an undergraduate or through an intercalation degree or industry.

References:

- Dowgray NJ (2021) An Epidemiological, clinical and biomechanical study in to age related changes in 206 middle-aged cats: the CatPAW study. PhD Thesis, University of Liverpool, UK.
- Gusnanto A et al (2021) Discriminatory cytokine profiles predict muscle function, fatigue and cognitive function in patients with Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS). (Submitted).

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To apply: please send your CV and a covering letter to Alex German (ajgerman@liverpool.ac.uk) with a copy to ilcamspgradmin@liverpool.ac.uk

Expected interview date/week

Week of 15 March 2021