Available MPhil Project: An Investigation of novel immunohistochemical markers and serum auto-antibodies in cats with chronic biliary tract disease

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Chronic biliary tract disease (CBD) is common in cats but poorly understood. Evidence suggests feline CBD might have several causes. Separating affected cats in to distinct disease categories is essential to help us understand causes and treatment. A proportion may be due to autoimmunity but this is unproven. In humans, demonstration of autoantibodies is one of the criteria for diagnosis of autoimmune liver disease. There are no previous studies on liver autoantibodies in cats, because of a lack of validated tests for feline use.

Bile acids have important functions in many organs including liver, gut and pancreas. Some new drugs for human bile duct disease target bile acid receptors. There are no studies on the role of bile acids and their receptors in feline liver disease.

This project aims to develop novel methods of measuring autoantibodies in liver disease in feline blood using fresh frozen normal cat liver tissue and blood from client-owned cats with CBD. Results will be correlated with histological findings in the liver including lymphocyte sub-sets and evidence of bile duct destruction. The study will also to investigate the role of two important bile acid receptors in feline liver disease, examining their expression and distribution in sections of liver on microscopy.

The objectives of this study are:

- To develop a novel, robust test for specific feline serum autoantibodies directed against liver and neutrophils
- To validate immunohistochemical histological stains in cats for two bile acid receptors of therapeutic relevance: Farnesoid X and TGR5
- To use the autoantibody test in stored and fresh blood samples from cats with CBD to increase understanding of the aetiology of the disease
- To correlate autoantibody results obtained with histological findings in affected cats including measurement of bile duct size to determine ductopenia and immunohistochemical markers for B and T cell subsets and bile acid receptors.

The Student will develop the following skills:

- Processing fixed tissue samples for standard histology and immunohistochemistry
- Histological interpretation and reporting of feline liver sections including quantification of stained cells and measurement of bile duct diameter
- Preparation and performance of imaging flow cytometry and immunofluorescence
- Validation of in cats of commercially available biochip kits for humans
- Communication with first opinion veterinary practices and production of a publicity leaflet to recruit prospective cases
- Training in generic and transferable skills through departmental and university courses including statistical analysis; time management and thesis preparation – approximately 10 days (or 20 equivalent 1/2 days) training over the year.

Funding: This successful candidate will receive a stipend of £18,000 and fees at the home rate.

Start date: October 2021

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