UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Faculty of Veterinary Science

Research project on Pathology available in the Department Paraclinical Sciences

Project title: Prevalence of CNS diseases in mammalian species at the UP-FVS, Pathology section from 2013-2023
Degree: MSc (Veterinary Science)
Study duration: 2 years (starting date: January 2023)
Minimum requirements: A BVSc Veterinary Science (or equivalent) degree. Experience and knowledge in veterinary pathology, especially histopathology would be an advantage.
Funding: A stipend of € 18 000/year will be provided.

Background:

Lesions in the central nervous system can be the result of a wide variety of causes including infectious (e.g., viral, bacterial, protozoal, fungal, parasitic, prions), or non-infectious (e.g., genetic/congenital, nutritional deficiencies, toxicoses, circulatory disturbances, neoplasia, etc.). The South African climate is conducive for the proliferation of diseases, especially vector-borne diseases. A combination of large farming communities, a wide variety of wildlife and many under-resourced communities in intimate interface with all species of animals provides a unique opportunity to study diseases/conditions affecting the CNS in animals.
Various vector-borne diseases are known to cause CNS disease in animals (e.g., West Nile virus, *Ehrlichia ruminantium*, *Babesia bovis*, *Babesia rossi*, etc.), and the climatic conditions in South Africa provide the ideal environment for proliferation of mosquitoes, biting flies and various tick vectors.
With large rural communities, the human-animal interface provides ideal conditions for zoonotic CNS diseases to occur. Informal settlements with communal grazing areas allow for mixing of animals of different species and different owners, and may even allow closer contact of humans and domestic species with wildlife. Close association between livestock farms and wildlife farms, or wildlife reserves also provides the opportunity for contact between livestock and wildlife, and the transfer of diseases from carrier hosts to susceptible species. Wildlife species plays an important role in carrying or amplifying certain vector-borne diseases, e.g., buffalo as a potential carrier for *Ehrlichia ruminantium*, or wildebeest maintaining alcelaphine herpesvirus 1. In turn, some diseases of domestic species can also be transmitted to wild animals, e.g., canine distemper virus in wild dogs and lions; and also to humans, e.g. rabies transmitted from dogs to wildlife, humans, or other livestock species.
Keeping livestock or wildlife species in extensive farming systems, with nutrient-poor grazing, or with few resources; or in intensively managed systems, with smaller fenced off camps, also leads to nutrition-related problems e.g., nutrient deficiencies and plant toxicosis. Overstocking in these

situations also allows the proliferation of ectoparasites, including tick vectors of potential CNS diseases, and even other infectious diseases associated with high stocking densities.
Some of the more commonly reported infectious and vector-borne diseases in South Africa affecting the CNS include heartwater, rabies, distemper, cerebral babesiosis, malignant catarrhal fever, listeriosis and West Nile virus. Some of the more common non-infectious conditions sporadically observed at UP-FVS are polioencephalomalacia caused by thiamine deficiency, closantel antihelmintic drug toxicosis, *Solanum tettense* toxicosis, copper deficiency and water deprivation/salt toxicity. However, there are many diseases that are reported less frequently and the exact prevalence of these conditions in different mammalian species, including wildlife, is unknown.
Many of these neurological cases in animals present to the Pathology section at the University of Pretoria Faculty of Veterinary Science (UP-FVS). The UP-FVS, Pathology section is also the only laboratory offering optimized and validated immunohistochemistry staining for a selection of infectious diseases in animals in sub-Saharan Africa. This provides the opportunity to identify/confirm many neurological diseases in a variety of mammalian species where histopathology is non-specific.
Even though, on average, more than 100 cases with CNS disease/lesions are reported in mammalian species every year at the UP-FVS Pathology section, no study has ever been conducted to determine the prevalence of these diseases/conditions.

Aim of the project: This study will aim to systematically review records relating to CNS disease of the past 10 years (2013-2023) at the FVS Pathology section, focusing on domesticated species (dogs, cats, equids, cattle, sheep and goats), as well as various wild ruminants-, equids- and carnivores.
The prevalence of all neurological conditions resulting in CNS lesions in domesticated species e.g. dogs, cats, horses, cattle, sheep and goats, and various wild ruminant-, equid- and carnivore species over a 10-year period (2013-2023) and possible trends/ patterns of disease will be determined.

CONTACT PERSON: Dr Lida Avenant, email: lida.avenant@up.ac.za; or Dr Johan Steyl, email: johan.steyl@up.ac.za, Department of Paraclinical Sciences.

Please send your CV, certified academic records and a motivational letter to the above-mentioned contact person. Two academic reference letters will be an advantage in the selection of the successful candidate

Students from Southern African Development Community (SADC) countries only

Deadline for submission of applications: 30 November 2022