Highest-ever research rating awarded to UP veterinary clinician-scientist

Posted on **May 04, 2022**

Professor Johan Schoeman

The National Research Foundation (NRF) has awarded Professor Johan Schoeman of the University of Pretoria (UP) a B1 rating for the 2022 – 2027 period, the highest rating ever achieved by a veterinary clinician-scientist in the University's Faculty of Veterinary Science.

Prof Schoeman leads the Pathobiology Research Theme in the faculty and is the former Head of the Department of Companion Animal Clinical Studies. In addition to reaching this research milestone, he has substantial clinical responsibilities at the Onderstepoort Veterinary Academic Hospital (OVAH), as well as undergraduate and postgraduate teaching duties.

Only two other researchers in the faculty have received a similar rating: Professor Christo Botha, former Head of the Department of Paraclinical Sciences, and Professor Alan Guthrie of the Equine Research Centre.

"I attribute most of my research success to the work done by my PhD students, both locally and abroad, on the pathobiology of the different disease models," Prof Schoeman said. "I must also credit the giants in the field of canine babesiosis research, such as my colleague and friend Professor Andrew Leisewitz, who was instrumental in setting up much of the research. Additionally, I have had the support of successive deputy vice-chancellors, deans and line managers at UP who have afforded me the opportunity to visit several international universities." Notably, in 2009, Prof Schoeman completed his PhD at the University of Cambridge under the guidance of eminent veterinary endocrinologist Professor Mike Herrtage.

In order for a researcher to attain a B1 rating, the NRF states that "all reviewers must be firmly convinced that the applicant enjoys considerable international recognition for the high quality and impact of their recent research outputs, with some indicating that they are a leading international scholar in the field".

Emergency thoracocentesis (draining of fluid from the chest cavity) in a Labrador presenting with difficult breathing.

When Prof Schoeman joined the faculty in 2000, after having worked as a veterinarian in the UK, he initiated research into the neuroendocrine inflammatory interface in canine critical illness. His research into this novel field capitalised on the uniquely large numbers of dogs with infectious diseases presented to OVAH – the *Babesia rossi* infection in particular is confined to sub-Saharan Africa. This protozoan condition is an excellent model of severe infectious disease and has translational value to other critical illnesses in canines and humans alike. As an internationally recognised clinical veterinary specialist in internal medicine with a PhD in endocrinology, Prof Schoeman has been instrumental in recognising the many spontaneous animal models of critical illness in this niche geographical area.

The professor and his team of researchers at UP and institutions abroad explored acute kidney injury, cytokine alterations, platelet dysfunction and other coagulopathies (bleeding disorders), pancreatitis markers, vitamin D statuses and more. This body of work provides the most comprehensive assessment of the effects of severe critical illness in any dog disease, and holds value for both veterinary clinical medicine and future research into other critical illnesses in dogs.

His research output places him among the top 1% of the most productive of researchers on canine babesiosis, and he is recognised as one of the world leaders in the area of the neuroendocrine-inflammatory interface in dogs. Several of his early papers are now considered seminal works, which, for the first time, describe thyroidal and adrenal hormone alterations and their prognostic value in detail in dogs. Moreover, his research has stimulated many researchers to further investigate aspects of the neuroendocrine alterations associated with inflammation and critical illness in humans and animals.

“Our research supports veterinarians and epidemiologists in South Africa to better diagnose, manage and prevent *Babesia rossi* infections in local dogs,” Prof Schoeman explains. “It also offers a model to

the worldwide scientific community working with other *babesias*, and is important to small-animal veterinarians who are managing dogs with severe inflammatory or infectious diseases, as it highlights the importance of endocrine parameters in the prognosis and treatment of these patients."

ECG monitoring and intravenous fluid therapy in a Boerboel bitch after surgery for peritonitis.

The high quality and impact of Prof Schoeman's work is evidenced by his collaborative research with world-leading researchers at research-intensive universities. This includes clinician-scientists from the Universities of Cambridge and Edinburgh in the UK, the University of Ghent in Belgium and the University of Copenhagen in Denmark.

"The disease burden in companion animals, mainly dogs and cats, in neighbouring African countries is largely unexplored," Prof Schoeman says. "In this regard, I am supervising two postgraduate students from the University of Namibia who will be studying disease manifestations of dogs and cats in that country." He adds that he would like to study the immune response and pathogen virulence factors in the variable disease manifestations across different species in Africa over the next decade. "The genetic, neuroendocrine and immune responses that lead to either virulent or asymptomatic infection in particular will be fascinating to explore," he adds.

The One Health and comparative medicine potential of Prof Schoeman's research field is substantial. (One Health refers to a collaborative approach that seeks optimal health outcomes by recognising that the health of people, animals and our shared environment are connected.) Several infectious diseases are listed in the top 10 leading causes of death as compiled by the World Health Organisation. Dogs can provide a vastly underutilised, naturally occurring model of infectious disease. Rapid progression of disease, short lifespan, shared environment and multiple offspring all contribute to the value of this model, as well as the development of similar diseases and the availability of similar diagnostic and therapeutic interventions in naturally occurring cases.

The study of the responses to critical illness in dogs allows for an assessment of a naturally occurring model of disease in an animal model that is more homologous in genomic sequence conservation to humans compared to laboratory models. Such research could alter our understanding of the pathophysiological response to infection and identify novel targets for therapy in canine babesiosis, and possibly other veterinary and humans infectious and immune diseases.

-Published by Hlengiwe Mnguni