



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

**PhD research project in Molecular Biology or Virology available at the  
Department Veterinary Tropical Diseases (DVTD)**

- Project title:** Persistence and transmission of foot-and-mouth disease virus in its wildlife reservoir co-infected with *Mycobacterium tuberculosis* and/or *Brucella*
- Study duration:** 3 years
- Minimum academic requirements:** MSc in Molecular Biology or Virology
- Added advantage and preference:** Undergraduate veterinary degree
- Restriction:** This call is restricted to South African applicants only
- Funding:** Research funds for the full project are available (excluding student stipend)
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**Background:** RNA virus pathogens are among the most important global biosecurity threats because of their high burden of morbidity and mortality, high mutation rate, the ability to cause uncontrollable outbreaks and the substantial burden on local and global economies. Understanding the mechanisms that enable persistence and transmission of highly transmissible viral pathogens in their host populations is thus a central problem in disease ecology. Pathogens replicate within hosts, transmit between individuals, and spread among host populations. Many viral and bacterial pathogens share the same host and pathogen-pathogen interactions within the same host may aggravate transmission through immune suppression. However, very few studies have looked at persistence and transmission from co-infected individuals. Here, we will investigate the transmission of foot-and-mouth disease (FMD) virus (FMDV), a positive sense RNA virus that is extremely contagious among livestock and many wildlife ungulate species. We hypothesize that immune activation by co-infecting bacterial pathogens may increase FMDV shedding and transmission from carrier African buffalo to other susceptible hosts. The project is a collaborative venture between the University of Pretoria, ARC-OVI, State Veterinary Services in the Kruger National Park and SANParks to monitor immunity, infection, contacts and viral evolution in buffalo experimentally infected with FMDV, *Brucella* and *M. tuberculosis*.

**Aims or the Project:** The aims of the project are to (1) investigate whether co-infection of FMDV, *Brucella abortus* and *Mycobacterium bovis* in buffalo have an effect of FMDV transmission in buffalo; (2) investigate the infection and persistence of a SAT2 FMDV in African buffalo; (3) determine the viral burden in carrier buffalo in nasopharynx and tonsillar crypts; (4) determine the rate of viral genetic evolution in carrier animals during transmission.

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**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**

**Deadline for submission of applications: 19 March 2021**