Faculty of Health Sciences

INFORMATION SHEET: INVESTIGATION OF NEUROLOGICAL DISEASE IN FARM AND WILD ANIMALS

Background. The emergence of West Nile virus as a cause of encephalitis of humans, farm and wild animals in Europe and North America, prompted the Centre for Viral Zoonoses (CZV) to investigate whether local strains of the virus in southern Africa were less pathogenic or had been overlooked as a cause of disease. It was found that West Nile and other **ar**thropod-**bo**rne **viruses** (**arboviruses**: viruses transmitted by blood-sucking arthropods such as mosquitoes, midges, sandflies and ticks), including Sindbis, Middelburg, Wesselsbron and Shuni viruses, account for a proportion of undiagnosed cases of fatal neurological disease not only in farm animals such as horses and cattle, but also in wild animals such as rhinoceroses, buffaloes, warthogs, giraffes and crocodiles. By submitting specimens for investigation you become a collaborator of the program and agree that we can use this in our research into zoonotic arboviruses.

Research tests consist principally of molecular procedures (RT-PCR) to detect viral genetic material (nucleic acid) in blood, brain, or spinal cord samples, but a DAFF compliant biosafety level 3 (BSL3) laboratory in the CVZ makes it possible to grow live virus from specimens in safety, and to prepare reagents for antibody tests, so as to facilitate virus identification at different stages of infection: during acute illness the presence of virus is detected by RT-PCR or culture, and later in the disease the diagnosis is established by demonstrating an immune response.

The Zoonotic Arbovirus and respiratory program in CZV specifically investigates zoonoses (diseases that humans can acquire from animals) and does not provide a general diagnostic service for veterinary pathogens, particularly controlled or notifiable diseases in terms of the Animal disease act, 1984 (Act No 35 of 1984). These diseases should be excluded by submitting specimens to the appropriate DAFF approved and SANAS accredited veterinary laboratories, with whom we collaborate.

Costs. Investigations are performed free of charge and funded by research grants, which have been sourced by the principle investigator. The investigations may be costly though and for this reason, only appropriate specimens that fit the case definition and that were taken during the correct phase of disease will be accepted. Since neurologic disease may only be the extreme manifestation of infection, arrangements can be made to test blood samples from additional animals on affected properties as part of the survey. **The viruses are endemic, and detection of an IgG antibody titre alone is indicative of past infection, but is not evidence of current or recent infection. This necessitates a follow up specimen for IgM testing for specimens outside of the viremic period where virus RNA can be detected or to investigate a rise in antibody levels.**

Specimens. Wear appropriate protective clothing (gloves, gown/apron, mask, goggles) when performing autopsies.

Live animals with neurologic disease: EDTA plus clotted blood can be taken and sent on ice packs. If possible spin down the clotted tubes by centrifugation before shipping.

Fatal cases: Submit 2cm^3 blocks of relevant brain and cord tissue with viral transport medium in separate labelled containers with ice (see attached diagrams). Alternatively, submit caudal quadrant (includes cerebrum, midbrain, cerebellum and brainstem) plus spinal cord (especially lumbar) and blood (eg cardiac puncture), sent with ice packs.

Unidentified virus isolates from veterinary pathology laboratories can also be submitted.

NB Include case details as requested on the accompanying submission form: species, age, sex, dates of onset, sampling and death, clinical signs, geographic location, plus contact details of persons from whom further information can be obtained, and to whom results can be reported. Indicate whether duplicate specimens have been submitted to a veterinary laboratory for the diagnosis of controlled and notifiable animal diseases **diseases in terms of the Animal disease act, 1984 (Act No 35 of 1984)** such as African horsesickness and rabies. Notify your relevant state veterinarian for all specimens submitted to the program since the clinical signs may be indicative of a suspected incidence of a controlled or notifiable disease and confirm this has been performed on the submission form prior to submitting the sample. Any specimens from cloven hooved animals from within the FMD infected or controlled zone have to be sent to Transboundary animal diseases (TAD) at the OVI for RNA extraction before it can be sent to the CVZ. A veterinary import permit have to be obtained from DAFF for specimens submitted from countries outside of South Africa on a cases to case basis and the samples imported in compliance with the conditions of the import permit.

Safety and quality control regulations require rejection of specimens that are degenerated/decomposed, or arrive in broken, leaking or otherwise unsuitable primary containers (syringes, plastic bags).

Send specimens to: Prof Marietjie Venter
Centre for Viral Zoonoses, Room 2-72, Pathology Building,
5 Bophelo Rd, Cnr Steve Biko and Dr Savage,
University of Pretoria Prinshof Campus, Pretoria 0001

Contact: Prof Venter: +27(0)123192282; marietjie.venter@up.ac.za; Olivia Lentsoane: **+27 (0)12 319 2329;** lentsoane.mo@up.ac.za;OR Megan Riddin: +27(0)123192282; megan.riddin@up.ac.za **to arrange for specimens to be received (see attached information on packaging). NB: send specimens by courier or via other laboratory services appropriate for specimen handling on ice and correctly packaged within 48 hours not by mail which is illegal and causes unacceptable delays that reduce specimen quality and have a biosafety risk. Specimens to be sent in clearly marked tubes, indicating material type and preservative - no needles or syringes allowed.** Questions can be directed to Prof Marietjie Venter at +27 (0)832930884, marietjie.venter@up.ac.za. For autopsies or histopathology on farm animals contact Dr June Williams, Section Pathology, Department of Paraclinical Sciences, Faculty of Veterinary Science, University of Pretoria, +27 (0)832348886, June.Williams@up.ac.za, and for wild animals Dr Johan Steyl at the same address, +27 (0)823984823, Johan.Steyl@up.ac.za.