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Epidemiology and pathogenicity of classical rabies virus (RABV) in South Africa

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Abstract

Rabies is a fatal zoonotic disease caused by members of the *Lyssavirus* genus (*Rhabdoviridae* family). In South Africa, dogs and wildlife carnivores maintain the canid and mongoose RABV biotypes respectively. These biotypes were confirmed through antigenic and genetic characterisation of RABVs from the virus collection at Onderstepoort. Through these studies, lyssaviruses were differentiated into classical RABV (99.5%) and MOKV (0.5%), and the RABV species further separated into the two RABV biotypes commonly identified in southern Africa. Although canid RABVs had homogeneous reactivity patterns on the anti-N Mab panel, those of mongoose RABVs were more heterogeneous. The usefulness of mAb typing panels in lyssavirus surveillance is discussed particularly with reference to the emergence of new species or spread of rabies biotypes to new geographic zones. At least 95% of the human deaths in South Africa are due to the canid RABV biotype begging the question of whether this biotype is more pathogenic than the mongoose biotype. Complete glycoprotein (G) nucleotide sequences of three typical South African RABV isolates [a canid, a mongoose and a spillover] were sequenced but no apparent differences were observed in their pathogenic domains. In reverse-genetics experiments, the ability of the chimeric viruses to trigger neurite outgrowth and regulate the expression of genes involved in neurosurvival were further assessed. In conclusion, the capacity of the three RABVs to kill 6-week-old female BALB/c mice after intra-muscular injection together with results from the reverse-genetics experiments suggest that mongoose RABV biotype may be less virulent than the canid RABV biotype.

Biography

Claude Sabeta completed his Ph.D in 2002 from the University of Pretoria (South Africa). He is a senior research scientist and Programme Manager (Food Feed and Veterinary Public Health), Onderstepoort Veterinary Institute, a premier agricultural research organization in South Africa. He has published more than 30 papers in reputed journals (both local and international) and reviews publications for many papers.