Application of immunohistochemistry and quantitative real time polymerase chain reaction to the study of tissue virus tropism in adult cattle infected with the bovine ephemeral fever virus

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While several studies have described the clinical and pathological aspects of bovine ephemeral fever (BEF), major gaps still remain in our understanding of the pathogenesis of the disease in cattle. In particular, the tissue tropism and potential replication sites for the virus in cattle remain undefined to date. The present study evaluated the tissue tropism and potential replication sites of the BEF virus (BEFV) in cattle. Specimens from nine Brahman cattle that died or were euthanized at different time points following natural BEFV infections were tested for viral antigens and RNA by immunohistochemistry and qRT-PCR respectively. Virus antigens were detected in several tissues/organs in all the study cattle and both virus antigens and RNA were simultaneously demonstrated in the spleen and/or haemal node from 7/9 cattle. The longest period of RNA detection was in the haemal node at 120 days after the initial qRT-PCR-based BEF diagnosis. Except for traces of extracellular antigen in the haemal node and synovial membrane, most of the viral proteins were intracytoplasmic within macrophages, neutrophils, dendritic cell-like cells and spindle shaped cells of perivascular location. Through demonstration of virus antigens in various tissues, this study has elucidated on the tissue tropism of the BEFV in cattle. On the basis of these findings, there appears to be preferential post-viraemic localization of BEFV in the spleen and haemal node. The likelihood of lymphoid tissues being potential in vivo replication sites of BEFV needs to be further investigated.

Biography

Robert Barigye is currently an Assistant Professor of Veterinary Pathology at the Department of Veterinary Medicine, College of Food & Agriculture, United Arab Emirates University in Al Ain UAE. Previously, he has worked as a Senior Veterinary Pathologist/Virologist at Berrimah Veterinary Laboratories, Department of Primary Industry & Fisheries in Darwin, Australia and before that as Veterinary Pathologist and Assistant Professor of Veterinary & Microbiological Sciences at North Dakota State University, USA. He holds a PhD in Veterinary Science from the National Autonomous University of Mexico (2003), MSc with Distinction in Veterinary Pathology from the Royal Veterinary College, University of London (1997) and is currently a candidate of MPhil degree (since Dec 2015) at the School of Veterinary Science, University of Queensland in Australia. In addition, he holds Membership by examination in Anatomic Veterinary Pathology of the Australian & New Zealand College of Veterinary Scientists (Pathobiology Chapter).

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