

Arboviruses



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Arboviruses are established as important causes of human and animal disease within Australia, as well as being high on the list of important emerging and exotic risk to Australia. They have been an integral part of the Australian ecological environment and evolved with it, adapting to our environment, to our arthropods, to our birds and to our mammals.

Most of what we know about human infections with these viruses has been described since the European settlement, but they must have been present and have infected humans and animals for extensive periods of time prior to that. Their ecology is influenced by multiple factors that modify human behaviour, animal populations, mosquito behaviour, and the environment. As such, we have seen, and expect to continue to see, changes in the epidemiology of the arbovirus infections within Australia, and ongoing risks of introduction of new arboviruses. The challenge is to predict, prevent and mitigate both current and future arbovirus threats to human and animal health, without damaging our environment and ecosystems. One Health in action!

In the past century we have seen a host of new influences on arbovirus infections: emergence of new global threats like Zika virus; re-emergence of old enemies like dengue, chikungunya and yellow fever; explosive growth of human travel and migration; expansion of human populations within Australia; international movement of goods and insect vectors; and natural and man-made environmental and climatic changes. Unfortunately, that has not

been accompanied by vaccines or antiviral agents for our Australian viruses so far, so our strategies for prevention of infections still rely on control of vector populations and avoidance of mosquito exposure.

This issue of *Microbiology Australia* addresses the impact of these viruses on human and animal health, the multidisciplinary approach to understanding them and their control, and dealing with those that are future threats to Australia. Improved methods for detecting and characterising these viruses and their vectors have expanded our understanding of patterns and drivers of spread. We still have some way to go in understanding the ecology of our endemic arboviruses, predicting our susceptibility to exotic viruses, tracking and controlling the mosquitoes, preventing and treating infections, and in understanding the complex interactions between the viruses, the insect vectors, the animal amplifiers, and the human or animal immune systems.

As you will see from this issue, these are important and fascinating viruses. In Australia, we are blessed with a great depth of expertise and knowledge about arboviruses and arboviral infection, and in developing cross-sectoral interactions. There is plenty more for us to do, and progress depends on a One Health approach nationally and with our international partners!

Biography

Clinical Professor David Smith BMedSc, MBBS, FRCPA, FACTM, FASM, FFSc(RCPA) is a graduate in Medicine from the University of Western Australia and trained in Medical Microbiology in Perth. He is a Medical Virologist at PathWest Laboratory Medicine WA at the QE2 Medical Centre in Perth, Australia, where he is a Director of the Arbovirus Research Laboratory. He is also a Clinical Professor in the Faculty of Health and Medical Sciences at the University of Western Australia. Professor Smith serves on a number of state, national and international committees and advisory groups, and is currently Chair of the National Arbovirus and Malaria Advisory Committee. He has a particular interest in public health issues, including mosquito-borne viruses, influenza and other respiratory viruses, and emerging infections.

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