# HUMAN HEALTH ASPECTS OF A POSSIBLE *LYSSAVIRUS* IN A BLACK FLYING FOX

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## Introduction

On 24 May 1996 a black flying fox displaying neurological signs was found in Ballina, New South Wales and submitted to the New South Wales Agriculture Wollongbar regional veterinary laboratory for autopsy examination. Histopathologic examination of the brain revealed severe non-suppurative encephalitis. Tissues were examined for evidence of equine morbillivirus (EMV) infection at the Animal Research Institute, Brisbane. Additional fixed tissues were sent to the Australian Animal Health Laboratory (AAHL) at Geelong for EMV and rabies testing. Results were negative for EMV. However, immunoperoxidase testing on fixed brain tissue was positive for *lyssavirus* antigen and was subsequently confirmed by immunofluorescence testing. Viral particles consistent with Rhabdovirus morphology were seen on electron microscopic examination of brain tissue. Cytoplasmic inclusions and tubular membranous structures suggestive of Rhabdovirus replication were also visible under electron microscopy in formalin-fixed brain samples. AAHL is currently attempting to isolate the virus using a range of cell cultures and mice inoculations.

The genus *lyssavirus*, family Rhabdovirus, includes classic rabies virus and five other rabies-like serotypes. The latter are Lagos bat virus, Mokola virus, Duvenhage virus and the European bat *lyssaviruses* (EBLV) 1 and 2. These viruses are all antigenically related but distinct. Rabies occurs in numerous countries in Europe, Africa, Asia, North America, Central America and South America, but the other rabies-like *lyssaviruses* have been recorded only in Africa and Europe. Australia is currently considered rabies free and no other rabies-like *lyssavirus* infections have been documented in animals or humans.

With the exception of rabies virus, human infections with members of the *lyssavirus* genus are rare. All members of the group however, except Lagos bat virus, have been shown to infect humans. Duvenhage and EBLV1 and EBLV2 have not been shown to occur in mammals other than bats and humans and are not thought to have a significant role in the spread of rabies-like disease to terrestrial mammals, including wildlife. This is in contrast to the situation in North America, Central America and South America, where the type of rabies found both in bats and in the main terrestrial carriers, racoons and foxes, is sylvatic classic rabies.

## Public health implications of *lyssaviruses* in Australia

In the absence of an isolated virus, investigations to date have indicated that the present *lyssavirus* is not classic rabies, serotype 1, and Australia's rabies-free status is not compromised by this finding. The extremely low health risk posed by rabies-like *lyssaviruses* combined with the probable isolated nature of this incident in Australia indicates there is not a need to change current public health advice. It is recommended that if people are bitten or scratched by flying foxes or bats, they should immediately clean the wound thoroughly with soap and water. People who are concerned about the wound should seek medical advice.

In 1986 the World Health Organization (WHO) issued general guidelines on bats and rabies which are documented in the eighth report of the WHO Expert Committee on rabies, TRS 824, WHO Geneva, 1992. Recommendations were that persons exposed to a non-rabies *lyssavirus* infected bat should receive the standard post-exposure rabies treatment recommended by WHO. The same applies to pre-exposure treatment of groups of people at risk of exposure to bats in countries where rabies or *lyssaviruses* are endemic in bat populations. In these countries, no differences are made in post-exposure treatment according to the type of *lyssavirus* involved. At present, there is no indication for specific *lyssavirus* treatment in people bitten or scratched by flying foxes or bats in Australia. The exception would be if the flying fox or bat was known to be infected with a *lyssavirus*.

Additional work is underway at AAHL in an attempt to characterise the specific *lyssavirus* involved. Isolation studies, if successful, will take up to one month to complete. It is unclear at the moment whether *lyssaviruses* are endemic in Australian flying fox colonies, although it is considered unlikely. Nevertheless, a surveillance system to investigate the presence of both EMV and *lyssaviruses* in sick and dead flying foxes is to be established by animal health authorities.

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