

# Scientists Develop Vaccine Against Deadly Viruses

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Scientists from the Uniformed Services University of the Health Sciences (USU), in collaboration with counterparts from the Australian Animal Health Laboratory (AAHL), have developed a vaccine to fight two deadly animal viruses that can infect and kill humans and are considered to be potential biological terror agents.

Dr. Christopher C. Broder, professor in the USU Department of Microbiology and Immunology, and Dr. Katharine Bossart, a former graduate student in that department and now postdoctoral fellow at the AAHL, along with their Australian colleagues, explained their vaccine discovery in the Sept. 27th online edition of the *Journal of Virology*, ahead of print.

Nipah virus and Hendra virus are recently emerged and closely related viral pathogens and both agents are considered to be potential biological terror agents. Nipah virus killed more than 100 people and a million pigs in Malaysia in 1999, while the Hendra virus killed two Australians and 16 horses in Australia's northern state of Queensland in 1994-95. Both viruses are carried by fruit bats in nature and have alarmed scientists with the ease in which they jump from animals to humans.

The new vaccine is composed of a component of the virus particle known as the G glycoprotein and its use has demonstrated complete protection from infection by Nipah virus in a feline model. Because these viruses are so similar, immunization with the component from either Hendra or Nipah

protected against challenge from both, indicating that a single vaccine may be effective against both.

Although members of this group of viruses have only caused a handful of focal outbreaks, the biologic property of these viruses to infect a wide range of hosts and to produce a disease causing significant mortality in humans and the recognition of their reservoirs in nature has made this emerging viral infection a public health concern.

Hendra virus reemerged in Australia in 2004 and 2006, and there have been five recognized outbreaks of human Nipah virus infection in Bangladesh between 2001 and 2005. To date, 102 human cases of Nipah infection have been documented in Bangladesh, and 75 percent of these were fatal. There is evidence that these recent Bangladesh outbreaks have not only direct bat-to-human transmission, but likely human-to-human transmission as well.

There are currently no approved vaccines available for Hendra virus or Nipah virus and no anti-viral drugs available to treat these types of viruses in general. The development and testing of this subunit vaccine was supported by the Middle Atlantic Regional Centers of Excellence and the National Institutes of Health.

Source: Uniformed Services University of the Health Sciences

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