

Monkeys in Asia harbor virus from humans, other species

November 19 2015, by Bobbi Nodell



Near the border of Cambodia, UW researcher Lisa Jones-Engel holds an Asian rhesus macaque. Credit: Lynn Johnson

When it comes to spreading viruses, bats are thought to be among the worst. Now a new study of nearly 900 nonhuman primates in Bangladesh and Cambodia shows that macaques harbor more diverse astroviruses, which can cause infectious gastroenteritis or diarrhea in humans.

"If you are a bat, you have bat astrovirus, but if you are a monkey, you could have everything," said Lisa Jones-Engel, a research scientist at the University of Washington National Primate Research Center and a co-author of the study, published today in *PLOS Pathogens*.

This research, the scientists said, is the first to show evidence of human astroviruses in animals, and among the earliest to demonstrate that astroviruses can move between mammalian species.

Astroviruses from a number of species, including human, bovine, bird, cow and dog, were detected in monkeys. This "challenges the paradigm that AstV (astrovirus) infection is species-specific," the authors wrote.

It is still unknown whether these [viruses](#) are two-way and can be transmitted to humans. They did find evidence that, in monkeys, two species of astrovirus recombined.

Knowing that [nonhuman primates](#) can harbor diverse astroviruses - including novel, recombinant viruses that may be pathogenic and/or more efficiently transmitted - highlights the importance of continued monitoring, the authors said.

This is particularly true in countries such as Bangladesh and Cambodia, where macaques and humans live side-by-side.

"This study is an example of the concept of One Health for new viruses," noted author Stacey Schultz-Cherry at St. Jude Children's Research Hospital in Memphis. "This is an indication that we really need to think

about animal partners in One Health."



Macaques on the sidewalk in Lop Buri, Thailand. Credit: Axel Drainville

Astroviruses are most commonly associated with diarrhea. They can also cause clinical diseases such as nephritis, hepatitis and encephalitis. Astroviruses also can be asymptomatic, depending on the species, the researchers reported. Currently, the only treatment is oral rehydration.

In this study of 879 samples of primate feces, 68 (7.7 percent) were positive for astroviruses. The majority of the positive samples (72 percent) were 79-100 percent similar to astroviruses associated with

human infections; 23.5 percent of the samples were similar to mammalian astroviruses isolated from diverse animal hosts including dogs, pigs and sheep. Slightly more than 4 percent of the positive samples were associated with avian astroviruses.

The team also collected blood samples, which confirmed that more than 25 percent of the monkeys had been infected with human astroviruses.

Whether the monkeys were getting sick from these viruses is unknown. The researchers said more study is needed to determine if astrovirus infections in nonhuman primates are associated with clinical disease, or whether such infections are asymptomatic. They said none of [monkeys](#) sampled in the study appeared to have clinical disease (e.g., diarrhea) at the time of sampling.

The scientists said they are currently working on analyses to model the ecological role that nonhuman primates play in maintaining the diversity of astroviruses, particularly in places where they share the environment with humans and other animals.

More information: Erik A Karlsson et al. Non-Human Primates Harbor Diverse Mammalian and Avian Astroviruses Including Those Associated with Human Infections, *PLOS Pathogens* (2015). [DOI: 10.1371/journal.ppat.1005225](https://doi.org/10.1371/journal.ppat.1005225)

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