

Researchers present bats as ecologically important, but disease brokers

June 26 2014, by Jeff Dodge

Bats: They've had a bad rap thanks to vampire movies and rabies fears, yet these little flying mammals play crucial and largely unappreciated roles in ecosystems.

Even so, disease and hunting are decimating [bat populations](#) – and that's a key reason about 150 of the world's foremost bat experts are swooping onto the Colorado State University campus this week for the Infectious Diseases of Bats Symposium.

Tony Schountz, event organizer and an associate professor in the CSU Department of Microbiology, Immunology and Pathology, said there are about 1,200 species of [bats](#), a number second only to rodents among mammals. In fact, every fifth mammalian species is a bat.

These species serve human and environmental health by keeping mosquito and other insect populations in check and by pollinating flowering fruit plants worldwide. Such benefits are threatened with the alarming spread of white-nose syndrome, an emergent disease that has killed millions of hibernating bats in recent years. And that's just one problem facing bats, Schountz said.

Bats are a conundrum because they also host virulent diseases that afflict humans, often without any symptoms. Schountz has studied the phenomenon in bats and, more extensively, [deer mice](#).

At a meeting of the American Society for Virology at CSU earlier this

week, Schountz delivered a lecture explaining how deer mice can be infected by a strain of hantavirus without succumbing to its effects. Hantavirus, he said, is a "smart" virus that survives by lurking in its host and being transmitted to other deer mice.

Hantavirus is a worrisome pathogen for people: Infection, typically through rodent urine and droppings, can lead to fatal disease. Doctors estimate that about 200,000 people are sickened by hantaviruses around the world each year.

"Tony has done groundbreaking work on how animal vectors – mostly deer mice and bats – can actually serve as vectors that transmit diseases to humans, rather than just die when they themselves get infected with some of these nasty viruses," said Jeff Wilusz, organizer of the virology meeting and a professor in the CSU Department of Microbiology, Immunology and Pathology. "The animals must interact with the viruses in very specific ways that result in the multiplication of the virus without getting the severe disease symptoms that other infected animals or humans would get. The answers to questions like these are at the cutting edge of the field."

This vector phenomenon might also occur in Egyptian fruit bats carrying the Marburg virus, which causes potentially fatal hemorrhagic fever in people and is in the same family as Ebola virus. As with deer mice and hantavirus, Egyptian fruit bats may be infected with Marburg virus without becoming sick. Instead, the animal functions as a viral reservoir.

"I think this story may be very similar to [hantavirus](#) and deer mice," Schountz said. "Bats are critically important animals, but they also carry viruses that are significant threats to human health. We need to learn more about them, to keep our bats healthy, to educate the public about the importance of bats, and to protect ourselves."

Researchers may gain insights about disease prevention and treatment by investigating how pathogens function in bats, including how they interact with host immune systems.

Provided by Colorado State University

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