ZOO

Zoo will study connections between animal, human health

West Nile virus, Avian flu, monkeypox, SARS — some of the world's newest and most frightening diseases are spread to humans by animals. A new initiative at the St. Louis Zoo will investigate the connections between animal and human health and work to find ways to stanch the spread of emerging diseases. The Institute for Conservation Medicine will be led by veterinarian and epidemiologist Dr. Sharon Deem.

"When you look at the past decade, about 75 percent of the emerging diseases are zoonotic, meaning diseases that can pass from animals to humans," Deem said. "We live in a changing world where I can leave here today and be in the middle of the last remaining forest of China in two days. We are up against each other more and more, and that helps these pathogens move easily."

Conservation medicine, also known as the "One Health" movement, acknowledges the obvious: The health of humans, animals and the environment are connected. Across the globe, medical doctors, veterinarians, biologists and other scientists from universities, hospitals and zoos are forming consortia to catalog new diseases, track their movements and stop their spread.

"Not long ago if you went to your practitioner, they wouldn't have been educated on something your child might have gotten from the pet dog," Deem said. "Now more and more people are seeing the connections. A lot of humans don't interface exactly with wildlife, but they have that middle man, their pet, sniffing around the backyard."

The institute will be funded by private foundations and grants. St. Louis Zoo President Jeffrey Bonner said the St. Louis Zoo was among the few zoos with a full staff of skilled pathologists, endocrinologists, nutritionists and epidemiologists as well as a reserve of wild animals to study. The zoo already has been conducting conservation medicine research through its WildCare Institute, including Deem's work studying birds in the Galapagos.
"We are perfectly positioned to do this, and we're obligated to," Bonner said. "There has been a lot of focus on human health and wellness and domestic animal health. Wildlife health has not received the same attention, but that is finally starting to change. We're here at the right time with the right set of resources to really make a difference."

Bonner stresses that wild animals, though often disease carriers, "are not the bad guys." Rather human population growth and development has wiped out large swaths of what was once called "the wild."

"There is an increase in interactions between humans and wildlife — human populations are moving into wilderness areas with their domestic animals and trading illegally in wildlife, which may lead to an increase in infectious diseases," Bonner said.

Deem has observed this firsthand during a 25-year career that has taken her to 20 countries.

"Find me a species on this planet that has not had some sort of impact from humans," Deem said. "You're a polar bear in the Arctic; you're a butterfly trying to get to Mexico. The wild is less wild than it used be."

Deem said early institute projects would include research on domesticated camels in Kenya and on Missouri hellbenders, large salamanders that live in Ozark rivers. Hellbender numbers have plummeted by 70 percent. Some scientists believe pesticide runoff has altered the hellbender's reproductive system. And, as it happens, the men of the region also suffer lower sperm counts.

"The health of hellbenders may not matter to you, but when you start talking about things like your ability to reproduce, then it becomes important," Deem said. "There have been studies of hellbender health and the health of streams, but the two really need to come together."

Deem's interest in conservation medicine was born in Zimbabwe, where, as a student, she studied a tick-borne disease called heartwater that was decimating cattle.

"Tick-borne pathogens can go on a lot of species — a cow, a kudu — and they do," Deem said. "It's one of the big killers of livestock in sub-Saharan Africa which, of course, affects the people. That's where I really started to see that interface between livestock and the wildlife."

Years later, Deem witnessed the explosion of another pest-borne disease — West Nile virus. She was working at the Bronx Zoo in 1999 when staff members identified the deadly disease's arrival in Queens. Scientists are still unsure how the disease, first discovered in the West Nile District of Uganda in the 1930s, arrived here. But it spread quickly, killing birds, horses and humans.

"It had never been seen before, so they couldn't fight it," Deem said. But scientists quickly came together to stem its spread.

"West Nile wasn't stopped; it crossed the country," she said. "But we don't know how bad it could have been if we had not developed vaccines, reduced mosquitoes and taught people
how to limit exposure. That is the sort of collaborative work we will be seeing more and more of. We have to."