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## An Uncommon Disease in Foxhounds

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**D**iseases, once thought of as not occurring or being very rare in the United States, are suddenly being diagnosed. West Nile virus is one example, another is leishmaniasis, a parasitic infection. This spring researchers at the North Carolina State University College of Veterinary Medicine identified *Leishmania infantum* as the organism that caused severe illness in several hounds in a foxhound pack in New York state.

Leishmaniasis, a zoonotic disease, occurs in animals and humans and the Centers for Disease Control began investigating. Over 9,000 foxhounds have been tested nationwide and seropositive foxhounds were found in 21 states and in Ontario, Canada.

The CDC is testing dogs of other breeds not associated with foxhounds and so far they have tested negative. Testing has also involved the people who handle the foxhounds, no positive tests have occurred.

The disease normally is transmitted by sand flies (*Lutzomyia spp.*) These tiny insects, which serve as a host

during one stage of the parasite's life cycle, are found in this country from Texas to New Jersey. In other areas of the world it has been found that dogs, humans, and rodents act as reservoirs for the organism and that the sand fly, when it takes a blood meal, spreads the disease.

"Species of the sand flies known to transmit *Leishmania* have not been identified in the areas investigated," said Dr. Peter Schantz, a veterinarian at the Centers for Disease Control. "However, vector surveys are still limited."

"Leishmaniasis is rarely seen in the U.S., and when it has been diagnosed in dogs they have usually been animals that were overseas for some time," said Dr. Phillip Scott, professor of microbiology. "The occurrence of the disease in foxhound packs is of concern because it is clear that these animals have been infected in the U.S. Understanding how these dogs became infected is crucial for controlling the disease in dogs, and ensuring that there are no human cases."

"Although direct transmission from an infected dog to humans has never been reported, it is speculated to be possible, and immunocompromised persons would be theoretically at greatest risk," said Dr. Schantz.

Nobody knows how the foxhounds became

infected. It is possible that an infected hound spread the disease to members of its pack and that it then spread to other packs. Foxhounds are not kept in individual kennels but in large pens where many animals live together. They have close contact. "It is known that in humans leishmaniasis can be transmitted through shared needles, blood transfusions and secretions," said Dr. Schantz. "So when you have dogs living as closely together as the foxhounds, it might be not surprising for the infection to spread through direct transmission, without the assistance of the vector."

Another contributing factor to the spread over a large geographic region is that foxhound packs are transported out of their area to meets where packs from different regions participate in the activities. As the animals run together, close contact is unavoidable.

The leishmania organisms are found world wide. The disease affects 12-15 million people in parts of Asia, Africa, the Mediterranean, and Central and South America. It takes

two forms, cutaneous, where the victim has open sores which leave discolored scars, and visceral, which affects various organs, such as the spleen, liver and bone marrow. If left untreated, it is fatal. Most of the affected foxhounds suffer from both forms.

Leishmaniasis is difficult to cure in humans and is not treatable in dogs, though it can be managed so that the animal's life is prolonged. The organism lives inside its host's cells, specifically inside the macrophage, a cell type that circulates throughout the body. Drugs to treat leishmaniasis are toxic compounds. Because the disease affects people worldwide, efforts are underway to develop preventive measures, such as vaccines. But it is a slow process. Here at Penn researchers are studying how the immune system controls these parasites, and hope to contribute to the development of a vaccine for leishmaniasis. "Vaccines not only have to stimulate the response, but they have to induce the right immune response that will lead to protection," said Dr. Scott. "Leishmaniasis has been studied by scientists for many years, not only because it is a human pathogen, but also because it has told us about how to get the right immune response." Studies in Dr. Scott's



Leishmania organism.

laboratory indicate that getting the right immune response may depend on the production of a host protein, called Interleukin-12.

Dog owners and breeders who contemplate importing a dog from overseas areas where the disease is common, should have the animals tested prior to importation. There is no state or federal requirement for this, but it is a sensible course. In recent years there have been a number of dogs imported which were later diagnosed with leishmaniasis.

## Scholarships

The New Jersey Veterinary Foundation awarded the Robert Schomer Scholarship to **Christina Fuocco, V'01**. **Joanne Crane, V'03**, received the Richard Klesmer Loan, a forgivable loan program that encourages graduates to return to New Jersey to practice. For every year the graduate works in New Jersey and belongs to the NJVMA, that portion of the loan is forgiven and converts into a grant. The Ch. Forfox Liz Claiborne, CDX scholarship and the Gundaker Foundation scholarship were awarded to **Emily Kupprion, V'03**. **Rachael Feigenbaum, V'01**, received the Barnstable County Agricultural Society scholarship and the Edward Bangs Kelley and Eliza Kelley Foundation, Inc. scholarship. **Amy Snedaker, V'04**, was awarded the Lake Region Kennel Club, Inc. scholarship. **Darah Resh, V'03**, was the recipient of the Lalitta Nash McKaig Foundation scholarship. The French Benevolent Society of Philadelphia's scholarship was awarded to **Eric Lombardini, V'01**. The Coon Dog Scholarship Fund scholarship was awarded to **Kate Johnson, V'03**, and The Westminster Kennel Foundation Scholarship was given to **Christina Fuocco, V'01**. **Aubrey Fecho Fitch, V'03**, received the Northwestern Connecticut Dog Club, Inc. scholarship and the Clifford R. Wright, Jr. Scholarship was given to **Diane Gabriel, V'01**. **Jennifer Marsden, V'02**, was awarded the Pet Products R&D scholarship. The William Goldman Foundation has given scholarships to **Edward Cooper, V'02**, **Melissa C. Geedey, V'02**, **Heidi Phillips, V'01**, and **Erin N. Mairs, V'02**.