

Researchers develop blood test for devastating disease of boas and pythons

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Dr. Elliott Jacobson is shown with a Dumeril's ground boa, a snake species affected by inclusion body disease. Credit: University of Florida

University of Florida researchers have developed a simple immune-

based screening test to identify the presence of a debilitating and usually fatal disease that strikes boas and pythons in captivity as well as those sold to the pet trade worldwide.

Known as inclusion body disease, or IBD, the highly infectious disease most commonly affects boa constrictors but pythons and other snake species in the boid family are also occasionally infected with the virus that causes the disease. IBD was first seen in [snakes](#) in the late 1970s, said Elliott Jacobson, D.V.M., Ph.D., a professor emeritus of zoological medicine at the UF College of Veterinary Medicine and co-author of a study that appeared in December in *PLOS ONE*.

"We don't know the prevalence, but we see more of IBD in the United States because there are some 2 million boas being kept as pets in this country," Jacobson said. "This simple blood test will help determine whether or not an animal has this disease and potentially will help clean up colonies of snakes that will ultimately be disease-free."

Although snakes infected with IBD may display neurological signs, such as head-tilting, chronic regurgitation or disequilibrium, there is also a population of snakes that are subclinical, meaning they are infected but otherwise appear healthy.

"That's a big problem, because healthy-seeming animals that are affected with IBD are being sold and sent around the world," he said. "However, they may develop the disease sometime later and may be the source of infection for other snakes."

On Jacobson's research team at the UF veterinary college were his former graduate student, Li-Wen Chang, B.V.M., Ph.D., the principal investigator in the study, and Jorge Hernandez, D.V.M., Ph.D., a veterinary epidemiologist.

To develop the test, the researchers studied a monoclonal antibody produced in response to a unique protein that accumulates in cells of snakes having IBD. They then sequenced the protein in an effort to further understand the nature and cause of the disease. Although the cause of IBD is unclear, the UF team found genetic links of this unique protein are associated with a family of viruses that primarily infect rodents but may infect humans. However, there is no evidence to indicate that the virus that causes IBD can infect people.

When Chang joined the study in 2008, she realized the limited availability of snake databases and potential causative agents of the disease presented additional challenges.

"It took us almost a year to finally produce this antibody, and three more years to validate its performance for immuno-based diagnostic tests," Chang said.

University of California-San Francisco researchers identified the Golden Gate virus in 2012 and scientists now consider it to be a potential cause of IBD.

UF's findings supplement that theory, although more studies of disease transmission need to be conducted to confirm the role of Golden Gate virus in the development of IBD, Jacobson said.

The research was performed at the UF's Interdisciplinary Center for Biotechnology Research through the university's veterinary diagnostic laboratories, where the new test is now offered. It will supplement existing molecular and histological tests, which are more widely available but also more expensive, Jacobson added. In addition, the test's ease of use and simplicity will offer veterinary practitioners a good first-line diagnostic tool to screen for IBD in snake species that show signs of the disease, or even before these signs occur.

"We know now that this disease exists in multiple collections and populations," Jacobson said. "It is important to determine why some snakes are not showing clinical signs of the disease. Could there be another agent operating synergistically? Perhaps one virus needs to be present but another virus needs to be present also, or perhaps the subclinical cases only have one of those agents, not both."

Only strict quarantine of new arrivals to snake populations and the culling of infected snakes, as well as mite control, can mitigate the spread of the disease, according to a 2013 fact sheet prepared by the American Association of Zoo Veterinarians' infectious disease committee.

"It's a situation of management," Jacobson said. "You'll never completely eradicate this disease."

Provided by University of Florida

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