

Results from the NSDTR Addison's Study (January 2005)

Researchers in the School of Veterinary Medicine at UC Davis are currently conducting research into Addison's disease (hypoadrenocorticism) in Nova Scotia Duck Tolling Retrievers. Addison's disease is caused by destruction of the adrenal glands resulting in decreased production of vital hormones. The clinical signs of Addison's disease can be non-specific and include vomiting, diarrhea, decreased appetite, weight loss, and slow heart rate. This disease is typically found in young to middle-aged dogs; however, it appears that some Tollers are developing signs at a very early age. The disease is usually manageable by administering the missing hormones to the dog, but it can be fatal. Thus, identifying the cause and, hopefully, eliminating this disease is extremely important to the Toller community.

In the first year of the project, we have collected 235 DNA samples specifically for the Addison's disease study. We also have access to 60 randomly collected Toller DNA samples some of which are being used as the normal controls for this study. We have identified and verified the diagnosis for 19 Addisonians (the diagnosis of one additional dog is still being verified). Of these 19, we were able to obtain DNA samples for 13 dogs.

There does not appear to be a sex-predisposition as we have identified nine males and ten females thus far. The average age at the time of diagnosis was 22.5 months (range 10 weeks to 6.5 years). Eleven of the 19 Addisonians are still alive, however, eight have died or been euthanized. Twelve dogs were less than one year of age at the time of diagnosis; of these, five have died or been euthanized (oldest euthanized at 4.5 years; oldest still alive is 4.5 years of age). Seven dogs were greater than one year of age at diagnosis and three of those have died or been euthanized.

Other diseases also present in these Addisonians include hypothyroidism, megaesophagus (2 dogs), inflammatory bowel disease, immune-mediated dental/gum disease (2 dogs), seizures (2 dogs), bladder stones and recurrent urinary tract infections, umbilical hernia, and pulmonic stenosis.

Of the 19 affected Tollers, we have DNA samples for both parents of nine affected animals and DNA samples for one parent of seven affected dogs. We also have DNA samples from 19 full siblings of affected Tollers. From this group, we have identified one dam and one full sibling with signs of immune-mediated disease. The one dam, who produced two Addisonian puppies in one litter, was eventually diagnosed with immune-mediated polyarthritis and the one full sibling was diagnosed with immune-mediated hemolytic anemia. Also, at least four litters were identified with two affected animals in the litter.

A small grant to support this research has been funded by the UC Davis Center for Companion Animal Health. This grant covers the costs of DNA preparation from the samples obtained, computer statistical analysis for the mode of inheritance, and the genetic examination of seven candidate genes including the Autoimmune Regulator (AIRE) gene which has been shown to cause Addison's disease in some human patients. Should it be determined that these candidate genes are not the cause in Tollers, a genome scan approach will be taken at which point further grant proposals will be submitted to the AKC Canine Health Foundation and Morris Animal Foundation for funding. Ultimately, we hope to provide a genetic test and counseling to help Toller breeders eliminate this devastating condition.

The study continues to accept DNA samples from Tollers, particularly from dogs affected with Addison's disease and their relatives. It is vital that we collect as many of these samples as possible so that our search for a genetic cause is not limited by too few individuals.

If you have any further questions or would like to participate, please see our online information at <http://faculty.vetmed.ucdavis.edu/faculty/dlbannasch/lab/index.htm> or please contact Dr. Hughes.

Angela M. Hughes DVM
Genetics Resident
Veterinary Medical Teaching Hospital
University of California
One Shields Avenue
Davis, CA 95616-8747
USA
ahughes@ucdavis.edu
(530) 754-2117

Danika L. Bannasch DVM Ph.D.
Chief of Genetics Service
Veterinary Medical Teaching Hospital
University of California

Anita M. Oberbauer Ph.D.
Professor
Department of Animal Science
University of California

Thomas R. Famula Ph.D.

Richard W. Nelson DVM DACVIM

Professor
Department of Animal Science
University of California

Professor: Veterinary Internal Medicine
Veterinary Medical Teaching Hospital
University of California