



PURINA Pro Club

Golden Retriever Update

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Research Focuses on Genetic Cause of Pigmentary Uveitis in Goldens

When "Angel," an American and Canadian Champion Golden Retriever, was diagnosed at 10 years of age with pigmentary uveitis (PU), her owner Mary Beth Konesky was shocked. "It was devastating because she was my first show dog and I knew I couldn't responsibly breed her line anymore."

Pigmentary uveitis — also called Golden Retriever uveitis — is a progressive eye disorder that generally results in blindness. Though the mode of inheritance has not been determined,

the condition has been considered an hereditary disease since around 2000. Dogs are usually older than 4 when diagnosed and have already been bred. Unlike inflammatory uveitis, a similar condition, pigmentary uveitis does not result from infection or other diseases.

Wendy Townsend, D.V.M., DACVO, assistant professor of comparative ophthalmology at Michigan State University, is studying DNA samples from affected dogs and their unaffected relatives to identify the causative gene for PU. She hopes to develop a

screening test that will help to reduce pigmentary uveitis in Golden Retrievers. "Hopefully, as we understand better what's driving the inflammation, we'll be able to develop better treatments," she says.

"Patients tend to do better the sooner it is recognized and the inflammation is controlled," Townsend explains. "If the condition is well controlled with medication, many dogs will go two or three years before glaucoma or cataracts develop."

Pigmentary uveitis has been diagnosed only in Goldens. The condition affects both males and females, usually in both eyes. An estimated 46 percent of diagnosed dogs later develop glaucoma and 33 percent get cataracts.

Townsend notes that some ophthalmologists are finding that iris cysts may precede the disease. "That doesn't mean your Golden Retriever will get pigmentary uveitis, but if the eye is

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How to Participate in PU Research

A study to find the genetic cause of pigmentary uveitis (PU) is currently under way at Michigan State University. Wendy Townsend, D.V.M., DACVO, assistant professor of comparative ophthalmology, is seeking DNA samples of affected dogs and their unaffected relatives. For information on participating in the research, please contact Townsend at townsend@cvm.msu.edu or visit www.grca.org/health/uveitis.html.

GRCA Is First Parent Club To Release DNA from CHIC Repository

The Golden Retriever Club of America (GRCA) is the first parent club to release DNA samples from the Canine Health Information Center (CHIC) DNA Repository. The samples will be used to support genetic research of mast cell cancer.

Fifteen samples were sent to the Broad Institute at MIT for use by Kerstin Lindblad-Toh, Ph.D., co-director of the Genome Sequencing and Analysis Program, and Cheryl London, D.V.M., Ph.D., associate professor in the Department of Veterinary Biosciences at The Ohio State University. They aim to identify the genes linked to mast cell cancer and to determine how Golden Retrievers are predisposed to the cancer.

"We hope to have an idea of what some of the causative genes are by December," London says. "Then, we'll try to see how the genes have been altered." The goal is to develop a DNA

screening test to identify dogs with mast cell tumor genes that can be used to selectively breed against the cancer.

The Golden Retriever Club of America was selected as the pilot breed for the CHIC DNA Repository in 2005. The repository collects and stores canine DNA samples along with information about genealogy, phenotype and a dog's lifetime health history.

"The intent of the CHIC bank was basically to have DNA samples ready whenever a research study needed them," says Rhonda Hovan, the GRCA Research Facilitator. "This first usage of the DNA bank is notable because it is proof of principle that the concept works. Literally within minutes after Dr. London contacted CHIC about her mast cell tumor research, we knew we had 15 of the samples she needed."

More than 1,200 DNA samples from Golden Retrievers are stored at the CHIC DNA Repository. The Golden

Retriever Foundation recently donated \$100,000 to underwrite the costs of continued blood collections by local Golden Retriever clubs at events such as Specialty dog shows.

"Just a small amount of blood yields enough DNA for hundreds of studies," Hovan says. "In contrast, a single check swab may be required for a single study. We prefer to bank blood samples because the idea is to have enough DNA from each dog for many years to come."

Either blood samples or buccal (cheek) swabs can be submitted for storage at the CHIC DNA Repository. For information about the DNA Repository, please visit www.canine-healthinfo.org/chicinfo.html. For information about participating in the mast cell tumor study, contact London at London.20@osu.edu. ■

Pigmentary Uveitis

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red, bloodshot, hazy or cloudy, the owner should take that dog in for an exam," she cautions.

A dog with PU usually isn't uncomfortable, Townsend says. However, most dogs eventually go blind because they have too much scarring within the eye to undergo cataract surgery and because glaucoma is manageable only for a limited time.

In cataracts, an opacity forms on the clear lens inside the eye, inhibiting light from reaching the retina. Eventually, the opacity covers the entire lens and functional vision is lost. Glaucoma is a condition in which fluid builds up within the eyeball causing pressure inside the eye to increase. If the pressure remains elevated for more than a few hours, permanent damage or blindness can result.

Sadly, Angel's diagnosis came three years after Konesky had stopped getting annual eye examinations for the dog and after Angel's 6-year-old daughter, "Tyah," was diagnosed. Now, Angel and Tyah are doing well treated with prednisone eye drops, and Konesky is keeping track of their offspring.

"I want everyone to be aware," says Konesky of Derby, N.Y. "Anyone who has a breeding program needs to have their dogs checked and continue to check their eyes every year. This is devastating when you think of how many Golden Retrievers potentially could be affected. No one wants to intentionally breed dogs carrying this trait."

Lifelong Annual Eye Examinations

The Golden Retriever Club of America (GRCA) recommends that all dogs have lifelong annual eye exams due to the fact that PU affects mostly older dogs without noticeable warning. Previously, the recommendation was for annual eye examinations until a dog reached 8 years of age.

In addition, the GRCA Health and Genetics Committee recommends that owners re-certify their dogs each year through the Canine Eye Registration Foundation (CERF). Doing so requires an annual eye examination by a board-certified veterinary ophthalmologist

who submits the results to CERF. The owner must also submit the results to CERF to obtain certification.

Test results from the CERF database are automatically shared with the Canine Health Information Center (CHIC) at no cost to owners. Sponsored by the Orthopedic Foundation for Animals and the AKC Canine Health Foundation, CHIC provides a centralized health database on individual dogs that recognizes specific health concerns designated by the parent club.

"We want owners to get both the annual exams and lifelong CERF certification," says Christine Miele, GRCA president. "This will create a permanent record for each dog that will be available in the future. If you're breeding a dog without getting CERF testing, just a few years from now all that information is lost."

She knows firsthand the importance of such records. One of her champions developed pigmentary uveitis about 20 years ago. "It didn't show up until a CERF exam when she was 5 years old. I stopped breeding her but she had had a litter when she was 3, when I didn't have any history," Miele recalls. "It used to be presumed that dogs were free of genetic eye conditions by 8 years old, but that's changed."

"Now, we're trying to preserve as complete a history on our dogs as we can, so we'll know the genetic influences on the pedigree. Unfortunately, many breeders could be breeding into affected lines because we don't have CERF or computerized records from way back."

In fact, until 2000, dogs with pigmentary uveitis were eligible to receive eye health clearances through CERF. "Now there's more information for us on the CERF form and it includes PU. It's a much more valuable tool," Miele says.

Annual eye examinations in conjunction with CERF certification are crucial because it's unknown how many dogs carry the pigmentary uveitis gene. In addition, the prevalent use of frozen semen in breeding means that it is possible that animals with the PU gene continue to be bred today.

"A dog being used at stud today could have died nearly 30 years ago

when we didn't have much genetic history," says Miele.

Seeking the Mode of Inheritance

Genetic research led by Townsend at Michigan State University involves analyzing blood from affected and unaffected dogs in the same family. Thus far, she has collected over 100 blood samples, although more samples are needed to advance the research.

"We suspect pigmentary uveitis is inherited but nobody has looked at enough pedigrees to say for sure," Townsend says. "I want to determine positively if it is inherited and the mode of inheritance."

Townsend is studying the white blood cells to see if a dog leukocyte antigen (DLA) is present in dogs with the disorder. If the DLA marker is found, then a simple blood test could be developed to determine whether a dog has a good chance of developing PU. Meanwhile, research to find the specific gene will continue.

The initial marker test could be available as early as 2008, Townsend predicts. If the gene responsible for PU is found, she hopes to have a direct DNA test in the next couple of years. This test would enable breeders and owners of Golden Retrievers to identify carriers and affected and normal dogs.

Konesky has contacted most of the owners of Angel's offspring who are grateful for the information and plan to take their dogs for annual eye examinations. "I feel responsible," she says. "How can I not? But fortunately I can offer these owners hope if they're getting their dogs checked annually and beginning early treatment. I want to get the word out and get more people involved so we can get PU under control." ■

Purina appreciates the support of the Golden Retriever Club of America and particularly Rhonda Hovan, the GRCA research facilitator, in helping to identify topics for the *Purina Pro Club Golden Retriever Update* newsletter.

Golden Retriever Foundation Joins Canine Cancer Campaign

The Golden Retriever Foundation (GRF) has become the first breed foundation to join the Morris Animal Foundation's (MAF) Canine Cancer Campaign by pledging to donate \$500,000 over the next five years.

"While GRF will continue to support individual studies through both the AKC Canine Health Foundation and MAF, we feel that it is vital to answer the challenge of this campaign with a substantive contribution from

the Golden Retriever community," says Barbara Zelechowski, GRF secretary-treasurer.

"Goldens have nearly double the cancer rate of most other breeds," says Rhonda Hovan, Research Facilitator for the Golden Retriever Club of America.

A recent GRF health survey attributed the top six causes of death in Goldens to different types of cancer. Sixty-six percent of male Golden Retrievers and 57 percent of females

develop cancer, with lymphoma and hemangiosarcoma together representing about half of all cases.

The Morris Animal Foundation launched a \$30 million, five-year fundraising campaign for canine cancer in April. The gift from the Golden Retriever Foundation is likely to be earmarked for lymphoma and hemangiosarcoma research. ■