



# PURINA Pro Club

## *Sporting Group Update*

Vol. 5, No. 2 ■ July 2007

### Brittany Endowed Fund Helps to Initiate Genetic Research

**T**he Brittany, with his superb nose and desire to please, is one of America's favorite pointing breeds. Happy and alert, he is a rugged worker in the field and a cozy companion in the home. Not unlike other breeds of dog, the Brittany has a fair share of genetic diseases including hip dysplasia and epilepsy.

A unique project that began three years with the founding of the Marvin D. Nelson Jr. Memorial Fund is helping researchers to learn more about genetic diseases in Brittany. The endowed memorial fund is named for longtime Brittany fancier Marvin D. Nelson, who died May 31, 2004. The fund honors three generations of Nelson family members, all passionate Brittany breeders.

Established by Gordon H. Theilen, D.V.M., DACVIM, professor emeritus of veterinary oncology at the University of California-Davis (UCD), the memorial fund provides a unique model for DNA testing. Hundreds of Brittany owners and breeders have contributed both to funding and DNA samples, which also are used for studying health problems in other breeds.

Theilen, who has bred Breton Brittany for 40 years, believes that the Brittany DNA bank housed at the Center for Companion Animal Health at UCD as a result of establishment of the memorial fund may one day help

researchers develop genetic tests for prevalent diseases. Ultimately, breeders may be able to use selective breeding to reduce disease incidence.

Chairman of Health Aspects and Genetic Defects for the American Brittany Club (ABC), Theilen says, "It is our responsibility as Brittany breeders to do everything possible to learn about genetic diseases so that our dogs may live long, healthy lives."

#### Collecting DNA for Genetic Testing

Genetic testing to find the gene mutations that cause canine disease requires a large amount of DNA. Three years ago, at the same time the Marvin D. Nelson Jr. Memorial Fund was founded, a Brittany DNA Library was established at the Center for Companion Animal Health (CCH) at UCD to collect DNA samples for that very purpose.

Mark Neff, Ph.D., director of canine genetics at CCAH, notes the success in collecting DNA samples from Brittany owners and breeders. "The Brittany ranks among the top five breed contributors," he says. "Through last April, the Brittany DNA Library contained 767 samples."

Collecting DNA samples is a collaborative effort involving breed club volunteers as well as CCAH workers. Katy Robertson, coordinator of DNA

collection, and Alison Ruhe, research assistant, frequently attend Brittany field events to collect DNA samples. Both are owners of herding dogs who compete in agility and herding trials with their dogs.

**"WE ARE DOING SOMETHING  
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ARE TAKING A BREED AND LOOKING  
AT ITS WHOLE GENETIC MAKEUP.  
WE WILL BE ABLE TO USE THIS  
DNA FROM FIELD TRIAL DOGS TO  
LOOK AT WAYS TO GENETICALLY  
IMPROVE BREED PERFORMANCE."**

*NIELS C. PEDERSEN, D.V.M., Ph.D.,  
DIRECTOR OF CCAH AND THE VETERINARY  
GENETICS LABORATORY AT UCD.*

The DNA will be used to study a variety of diseases in the Brittany. The primary genetic disorder affecting the breed is hip dysplasia. Other health problems are epilepsy, cleft palate, overshot and undershot jaw, hypothyroidism, deafness, adult cataracts, and cruciate ligament tears. Diabetes

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### Marvin D. Nelson Jr. Family Remembered for their Love of Brittany

**T**he Marvin D. Nelson Jr. Memorial Fund honors three generations of passionate, dedicated Brittany breeders. In the 1960s, Marvin D. Nelson Sr. and his wife, Frances, raised many dual champions. They would often compete at a field trial and then load their dogs into their plane to fly to a nearby conformation dog show. Their National Amateur Field Champion Towsey Bub was one of the first American Brittany Club national champions.

Their son, Marvin D. Nelson Jr., was a career Navy pilot. He and his family lived in San Diego. In the summers, daughter Frances frequently visited her grandparents in Kansas, where she acquired a love for Brittany. She graduated from the School of Veterinary Medicine at Kansas State University and married Greg Savage. They moved to Lincoln, Neb., where Frances began her veterinary practice.

The couple enthusiastically competed with their Brittany. Frances took the dogs into the ring, and Greg handled them in field trials. After Frances' father retired from the Navy and her mother had died, she talked Marvin D. Nelson Jr. into co-owning a Brittany with her. The dog became National Amateur Field Champion Rebel's Tough Is Tyronne. Nelson Jr. was hooked. He became an avid field trial participant and got acquainted with Gordon Theilen, breeder of Breton Brittany in Dixon, Calif.

Then, tragedy struck. Frances and her three sons and four dogs were traveling to a dog show in Minneapolis. Her oldest son was driving. During a terrible rainstorm in Iowa, the vehicle began to hydroplane and the son lost control. Frances and the two younger boys died.

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## Brittany Endowed Fund

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insipidus, an adrenal hormone imbalance, infertility and behavior traits also will be studied.

A new DNA collection that began last spring involves taking blood samples from Brittany's that compete in field trials to provide information about performance traits. Samples were collected from dogs that placed at the American Brittany Club Pheasant Classic Championship last March. These samples are part of the new Brittany DNA Bank of Champions.

"We collected DNA from all but one of the placing dogs and most of those participating at the Pheasant Classic Championship," Theilen says. "Registry numbers and a dog's sire and dam were recorded. When a characteristic is being studied, a good way to locate gene markers is by tracing family pedigrees. These samples and those collected in the future are important."

A dog's starting ability, staunchness of pointing, scenting skills and ability to back are among the traits that will be evaluated from a genetic standpoint. "We are doing something no one else has done," says Niels C. Pedersen, D.V.M., Ph.D., director of CCAH and the Veterinary Genetics Laboratory at UC Davis. "We are taking a breed and looking at its whole genetic makeup. We will be able to use this DNA from field trial dogs to look at ways to genetically improve breed performance."

The Veterinary Genetics Laboratory, one of the largest DNA diagnostic service laboratories in the world, processes more than 200,000 genetic tests a year,

Pedersen says. "We are a nonprofit institution and also an integral part of the School of Veterinary Medicine. Our goal is to provide DNA testing at a low cost to help ensure that testing is available for people regardless of income. We believe this holds enormous potential in learning about the genetics of dogs as well as other species."

Advances in the technology used to process DNA and sequencing of the canine genome help to promote understanding of genetic disease in dogs. While the collection of DNA from cheek swabs used to be common, researchers now are finding that blood samples provide far more DNA material to work with. Just a small amount of blood yields enough DNA for hundreds of studies, while a single cheek swab may be required for a single study.

"We used to collect one swab to locate 12 markers on a genome to identify a dog," Theilen says. "Then, we needed three swabs to identify 350 markers. We can now identify 125,000 markers but need to collect blood samples rather than swabs. Dr. Neff believes that with 125,000 markers we have the ability to find gene loci in one test. If we can find a genetic marker for a disease, we can effectively breed it out of a bloodline."

"In the past six months, we have made tremendous strides because of new technical advances," Neff says. "We used to think that collecting samples of DNA from families of dogs was the best way to identify gene markers for a particular disease. Multifactorial diseases with genetic and environmental influences, such as hip dysplasia and epilepsy, require

the study of a larger population.

"What we want to do is collect DNA samples from severely affected dogs that carry all the genetic factors and have been exposed to environmental influences, and then compare these samples with those of unaffected dogs or even a random sampling. We are looking for an increased frequency of a DNA marker in affected dogs relative to the control DNA set."

The key to success is input from Brittany breeders and owners. "What makes the Brittany research so important is that Dr. Theilen has been able to bring the entire breed community on board to help locate and identify affected dogs," Neff says. "This is basically a composite study focused on one breed. The best dog biologists are the dog owners. They are the ones who have the power of observation, the passion and are in greatest command."

The Marvin D. Nelson Jr. Memorial Fund serves as a model for other breeds and for those concerned with the health and welfare of Brittany's. "We have to get serious about our desire for genetic improvement in our breed," Theilen says. "We should have a 10-year goal of diminishing current health problems."

The final outcome — the ability to collect DNA for research and then to selectively breed dogs when genetic tests that identify gene mutations are developed — lies with Brittany breeders and their honesty and willingness to eradicate disease. The overwhelming response from Brittany community indicates that they are dedicated to that goal. ■

## Marvin D. Nelson Jr. Family Remembered

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The son driving the vehicle was badly injured. None of the dogs were killed.

Frances' father, Nelson Jr., continued his interest in Brittany's but never could recapture the zeal he had before the accident. When Nelson Jr. died in 2004, his cousin and close friend, Portuguese Water Dog breeder Jan Mosher, was asked to help with funeral arrangements. Larry Hagedorn, a member of the Southern Kansas Brittany Club, asked Mosher where people could donate money in Nelson's memory.

Mosher thought of the Portuguese Water Dog Club of America's successful efforts through its Health Foundation and suggested a fund to study Brittany health issues. Hagedorn called Theilen, professor emeritus of veterinary oncology at the University of California–Davis (UCD). Within a few days, Theilen had established basis for a memorial fund in his good friend Nelson's name. The fund would be used for Brittany research in conjunction with the Center for Companion Animal Health at UCD.

Shortly thereafter, at the 2004 American Brittany Club All-Age and National Show, Theilen explained the purpose of the memorial fund to the board and club members. By the end of the Nationals, he had collected the \$10,000 needed to establish an endowed fund at UCD. Currently, the fund exceeds \$40,000. The Brittany

DNA research has received support of more than \$50,000 from the Veterinary Genetics Laboratory at UCD.

"So far, no money or interest from the memorial fund has been used, thanks to the generous support from the Veterinary Genetics Laboratory at UCD," Theilen says. "The goal is to build the fund to \$100,000 by the end of this year, and eventually to \$1 million. As donations come in and the fund grows, we plan to use only the interest with matching funds from organizations such as the AKC Canine Health Foundation."

Meanwhile, the efforts to collect DNA samples continue. Mosher notes that she sent a letter about the fund and the Brittany DNA Library to regional clubs. "As a result of this one mailing, we were able to set up collections at four specialties and the American Brittany Club National," she says.

Financial donations and genetic samples both are needed to continue the Brittany research. For information about the Brittany DNA studies, visit [www.vgl.ucdavis.edu/research/canine/projects/brittany/](http://www.vgl.ucdavis.edu/research/canine/projects/brittany/). For more information, please contact:

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