



Dachshund

Update

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Dachshund DNA Samples Help Advance Understanding about Hemangiosarcoma

Though Dachshunds are not among the breeds considered at high risk for developing the cancer hemangiosarcoma, concerned breeders and owners, along with the Dachshund Club of America (DCA), are taking steps to increase awareness and collect DNA samples to support ongoing research.

One of the most baffling cancers for scientists and owners to understand, hemangiosarcoma is extremely aggressive and highly malignant. It usually has metastasized by the time it is discovered. Hemangiosarcoma is called a silent killer because it seldom is detected before the tumor ruptures, causing a life-threatening condition.

"Dachshunds are not a breed we normally associate with hemangiosarcoma, and we really don't know whether there are more cases now or just more awareness and diagnosis of the disease," says Matthew Breen, Ph.D., C.Biol., FSB, professor of genomics at North Carolina State University College of Veterinary Medicine.

As the parent club's liaison to Breen's laboratory, Barbara Axel of Pisgah Forest, N.C., is working to encourage owners and breeders to submit DNA samples from dogs diagnosed with hemangiosarcoma. Axel, who lost two Dachshunds to the cancer, is passionate about helping to advance understanding of hemangiosarcoma in the breed.

In 2010, her red longhaired Standard Dachshund, CH Camp Guthrie Mountain Mist L, TDI, a granddaughter of her first Dachshund that died from hemangiosarcoma, woke up one morning with pale gums and listless behavior. Sensing that something was terribly wrong, Axel took "Mischief" to the emergency veterinary clinic. A radiograph did not show abnormalities, but blood work indicated internal bleeding. Having experienced the cancer in Mischief's granddam, Axel recognized the signs of hemangiosarcoma.

A biopsy of Mischief's spleen was taken to learn whether the Dachshund had a benign hemangioma or malignant hemangiosarcoma. The veterinarian could not stabilize the dog, and she died in the emergency room. An autopsy showed hemangiosarcoma in the spleen and liver.

"This is how it happens," Axel says. "One day, your dog seems fine, and the next day, it dies. This is what makes hemangiosarcoma so frustrating and tragic. Mischief had been to the veterinarian and received a clean bill of health not long before this happened."

In an effort to keep hemangiosarcoma in a low-risk category in Dachshunds, the DCA board of directors recently pledged \$10,000 from the Donor Advised Fund at the AKC Canine Health Foundation, and the DCA Health

and Welfare Trust Fund donated \$2,000. Both donations are specifically for hemangiosarcoma research. Additionally, the DCA Health and Welfare Trust Fund is providing reimbursement for the shipping of blood and tissue samples taken by veterinarians from affected dogs to Breen's laboratory. Breen shares the DNA samples with other researchers who are studying cancer. A significant number of DNA samples from Dachshunds are needed to provide meaningful information about hemangiosarcoma in the breed.

The funding comes partly from more than \$4,000 raised in a silent auction at the 2012 DCA National Specialty. Diane Young McCormack of Reno, Nev., spearheaded the silent auction to raise awareness and generate samples for research. "We hope that our samples will help unlock the mystery of this disease before it becomes a significant problem in our breed," she says.

The DCA website, at www.dachshund-dca.org, features a link on its home page to a hemangiosarcoma information page. Information about the cancer, clinical trials, early detection tests and forms for submitting DNA samples are provided to help educate breeders and owners of Dachshunds about the cancer.

Fueled by a Rich Blood Supply

Though any breed could potentially develop hemangiosarcoma, at-risk breeds include Bernese Mountain Dogs, Boxers, Flat-Coated Retrievers, German Shepherd Dogs, Golden Retrievers, Portuguese Water Dogs, and Skye Terriers. Golden Retrievers are highly affected, with about 20 percent dying from the cancer. Experts estimate about 100 Dachshunds are diagnosed with the cancer each year.

Comprising 5 to 7 percent of all canine cancers, hemangiosarcoma typically originates in the endothelial cells, the thin layer of cells that line the interior surface of blood vessels. The rich blood supply of the blood vessels contributes to the cancer's metastasis throughout the body.

As the cancer cells circulate through the bloodstream, they eventually attach to a primary tumor site. About 50

Breeders and Owners Can Contribute to Hemangiosarcoma Research

Dachshund breeders and owners whose dogs have been diagnosed with hemangiosarcoma are encouraged to have their veterinarians submit blood and tissue samples to help advance research of this cancer.

Samples can be sent to the laboratory of Matthew Breen, Ph.D., C.Biol., FSB, professor of genomics at North Carolina State University College of Veterinary Medicine, who is coordinating the collection and sharing of DNA samples with other cancer researchers. To learn about the Breen laboratory and research of hemangiosarcoma, go to www.breenlab.org/recruitment.html.

To contribute samples, visit the website of the Dachshund Club of America (DCA) at www.dachshund-dca.org. A link is provided on the home page to the hemangiosarcoma page containing a sample submission form. Owners should contact the Breen laboratory prior to sending samples via email at info@BreenLab.org. The DCA Health and Welfare Trust Fund provides reimbursement of expenses for shipping samples to Breen. For information, visit www.dachshealth.org/projects.html.

Hemangiosarcoma samples also can be shipped directly to the Van Andel Institute to support ongoing research. Visit www.vai.org/helpingdogs for instructions for veterinarians on sample collection and information and consent forms for owners.

Dachshund DNA Samples

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percent of cases develop in the spleen. Other primary sites are the heart, liver, skin, kidneys, mouth, muscle, bone, brain, and bladder.

"Most cases we see — about 85 percent — are the visceral form of hemangiosarcoma with spleen, liver or heart involvement," Breen says. "Cutaneous and subcutaneous forms that develop on or under the skin make up the other 15 percent."

The Path of Hemangiosarcoma

A challenging cancer to recognize, partly because signs are not apparent until it has metastasized and the tumor has ruptured, hemangiosarcoma is considered a silent killer. Owners usually seek emergency care for these signs:

- Listlessness
- Pale gums
- Sudden collapse
- Distended, fluid-filled abdomen, which occurs with tumors in the spleen

During emergency treatment, veterinarians often detect anemia and the abdomen filled with blood. They may perform a blood transfusion, followed by a splenectomy to remove part or all of the spleen. A biopsy of the spleen indicates whether a dog has a benign hemangioma or malignant hemangiosarcoma.

While chemotherapy may give a dog a few months longer to live, surgery to remove the spleen usually is ineffective because the cancer already has metastasized and is circulating in the blood.

As the cancer grows, angiogenesis, a normal process in which new blood vessels are generated from existing blood vessels, feeds the cancer through a tortuous network of blood vessels that cause clotting and hemorrhaging. Mini-hemorrhages heal quickly with few signs, but hemorrhaging of a large tumor can be fatal.

When a tumor in the spleen or heart ruptures and bleeds into the abdominal cavity or the pericardial sac, it results in acute weakness, collapse and shock. Dogs often have pale gums. These signs, similar to what Axel noticed in her Dachshund Mischief, are dramatic and usually prompt owners to seek emergency veterinary care. They often are the first obvious sign of a problem.

"We have seen dogs with tumors of several pounds cause no clinical problems, which makes early detection difficult," Breen explains. "It also is a highly metastatic cancer, so by the time a large mass is detected metastasized tumors are present with devastating consequences."

Without treatment, survival is short, especially if the cancer is in

the spleen or other internal organs and the dog has collapsed due to internal hemorrhage. Despite the best standard therapy — surgery and chemotherapy — most dogs do not live more than six months. Surgery is not a cure because the cancer almost always has metastasized by diagnosis. The cancer also resists chemotherapy and spreads quickly and invasively into vital organs.

Since signs of hemangiosarcoma are not apparent until the cancer is in its advanced stages, it is nearly impossible to detect early. The cancer adapts to its microenvironment and mimics the tissues to which it attaches. It does not show up in blood tests until hemorrhaging occurs, and ultrasounds fail to detect fast-growing tumors.

As Jaime Modiano, V.M.D., Ph.D., the Perlman Endowed Chair in Animal Oncology at the University of Minnesota College of Veterinary Medicine, says, "As we learn more about this cancer, we realize the more we learn, the less we know."

Identifying Susceptibility Factors

A recently completed study in Golden Retrievers focused on the relationship between inherited traits and dogs' susceptibility to hemangiosarcoma and lymphoma. The collaborators, Modiano, Breen and Kerstin Lindblad-Toh, Ph.D., director of vertebrate genome biology at the Broad Institute of MIT and Harvard and professor at Uppsala University in Sweden, wanted to learn if there is a link between the two cancers that are common in the breed.

The study, called MADGiC: Making Advanced Discoveries in Golden Cancers, aimed to find genetic markers that predispose dogs to the cancers.

"Ultimately, our goal was to provide breeders with information to help reduce disease incidence while retaining the positive phenotypes of their breed," Modiano says.

Though the data is being prepared for publication in a scientific journal, the results have been exciting, Breen says. "We found things we didn't realize we would find. This study is testimony to the power of an integrated collaborative approach. While these early data are focused on Golden Retrievers, identifying risk factors in one breed makes it much easier to assess the role of those risk factors in other breeds, such as Dachshunds."

In a new hemangiosarcoma investigation, Modiano is exploring the nature of cancer stem cells, or tumor-initiating cells. Due to stem cells' adaptability to various environments and their resistance to conventional therapies, Modiano believes they are the true instigators of cancers like hemangiosarcoma.

The hope is that these cells can be genetically altered along specific pathways to foil their transformative abilities, he says. "The intent is to use the potential of these cells to become different cell and tissue

types and force them down a path that would eliminate the danger of metastasizing or hemorrhaging, which ultimately is the cause of death for most dogs with this cancer."

The biochemical pathways that control hemangiosarcoma also are the focus of research under way in several breeds of dog, including Dachshunds, at the Van Andel Institute in Grand Rapids, Mich. A nonprofit medical research facility, Van Andel studies diseases in dogs that could illuminate human health issues with a goal of developing effective personalized medicine. The hemangiosarcoma research in dogs may help them learn more about a similar, but rare, cancer in humans, angiosarcoma.

The first results of the research are expected to be published soon. "We look at the biochemical pathways that get turned on in canine tumors so we can better understand how the tumors work," explains Nick Duesbery, Ph.D., head of the Laboratory of Cancer and Developmental Cell Biology. "To do this, we collect tumor samples, break them apart in their component cells, grow them in cultures and analyze the pathways that are turned on or off when they are treated with different drugs."

As scientists learn more about hemangiosarcoma, the opportunities to better understand genetic risk factors and develop improved treatments increase. Though Dachshunds are not considered at high risk for developing the cancer, those who love the breed are eager to encourage the submission of DNA samples to help advance breed-specific research. Even one case of hemangiosarcoma in Dachshunds is one too many, they say. ■

Purina appreciates the support of the Dachshund Club of America and particularly Charlotte Borghardt, chair of the DCA Health Committee, in helping to identify topics for the *Purina Pro Club Dachshund Update* newsletter.

Send Us Your Questions

Have questions about your Purina Points or how to redeem weight circles for rewards and rebate checks? Contact *Purina Pro Club* at 877-PRO-CLUB, or 877-776-2582, between 7 a.m. and 5 p.m. CDT Monday through Friday. You also may visit www.purinaproclub.com to review and redeem Purina Points.

Want to Reach the Editor?

Have comments about *Purina Pro Club Update*? Send them to us at: *Purina Pro Club Update*, c/o Editor, Nestlé Purina PetCare, 2T Checkerboard Square, St. Louis, MO 63164 or via email at today'sbreeder@purina.com.

Purina-Sponsored Sporting Events*
June to August 2013

Event	Date	Location
Purina All-Age & Top Shooting Dog Awards	June 14-15	Oklahoma City, OK
American Kennel Club National Amateur Retriever Championship	June 15-23	Mondovi, WI
Professional Kennel Club Breeders Showcase (Coonhounds)	July 25-27	Aurora, KY
The Chase-Purina Classic Bench Show (Foxhounds)	Aug. 10	Carlisle, KY

* This table lists some, but not all, upcoming Purina-sponsored sporting events.

Latest Standings Announced in Pro Plan Champions Cup Award Program

GCH Mt. View's Ripsnorter Silver Charm, a 6 1/2-year-old German Wirehaired Pointer, is leading the *Pro Plan* Champions Cup standings with 163 points earned through April 30. The No. 1 dog in the country in 2012, "Oakley" was bred by Helen George and Claire and Kelly Wisch. He is owned by Victor Malzoni Jr. and handled by Phil Booth. Oakley placed second in last year's program.

The yearlong *Pro Plan* Champions Cup award program is based on points tabulated from Bests in Show and Group placements at more than 200 Purina-sponsored all-breed dog



shows. This year's winner will be determined in early 2014.

The *Pro Plan* Champions Cup winner will receive a \$10,000 cash prize, an original oil painting by dog portrait artist Linda Draper and a keepsake *Pro Plan* Champions Cup trophy. A

permanent *Pro Plan* Champions Cup is displayed at the Purina Event Center in Gray Summit, Mo., along with a plaque engraved with the winners' names.

Cash prizes will be awarded as follows:

- Second place, \$5,000
- Third place, \$2,500
- Fourth place, \$1,250

To view a tabulation of individual dog's points and a listing of qualifying shows, please visit the *Purina Pro Club* website at www.purinaproclub.com. The *Pro Plan* Champions Cup is sponsored by *Purina Pro Plan* brand dog food. ■

2013 Pro Plan Champions Cup Standings

Dog	Breed/Variety	Points Earned*
GCH Mt. View's Ripsnorter Silver Charm	German Wirehaired Pointer	163
GCH Claircreek Impression De Matisse	Portuguese Water Dog	128
GCH Afterall Painting The Sky	Wire Fox Terrier	116
GCH Marlex Classic Red Glare	Miniature Pinscher	95
GCH Tells Matrix Reloaded	Afghan Hound	85
GCH Downhome Hitech Innovator	Harrier	62
GCH Scylla's Small Kraft Re-Lit	Maltese	57
GCH Kenro's Witching Hour	Giant Schnauzer	56
CH Bugaboo's Picture Perfect	Old English Sheepdog	54
GCH Kan Sing's Tenzin	Tibetan Spaniel	54

*Points earned through April 30, 2013

Purina-Sponsored Dog Shows*
June to August 2013

Event	Date	Location
Oklahoma City Kennel Club Dog Show & Summer Classic	June 19-23	Oklahoma City, OK
Central Florida Kennel Club Dog Show & Cluster	June 20-23	Orlando, FL
Texas Kennel Club Dog Show & Lone Star State Classic	July 4-7	Dallas, TX
Ann Arbor Kennel Club Dog Show	July 5-7	Monroe, MI
Houston Kennel Club Dog Show & Reliant Park World Series of Dog Shows	July 17-21	Houston, TX
Greenville Kennel Club Dog Show & Carolina Foothills Dog Show Summer Cluster	July 25-28	Greenville, SC
Steel Valley Cluster	Aug. 1-4	Canfield, OH
Harrisburg Kennel Club Dog Show & Keystone Cluster	Aug. 9-11	Harrisburg, PA
Olympic Kennel Club Dog Show	Aug. 15-18	Enumclaw, WA
Cherokee Rose Summer Cluster	Aug. 22-25	Atlanta, GA
Santa Barbara Kennel Club Dog Show	Aug. 24-25	Santa Barbara, CA
Bluegrass Classic Dog Shows	Aug. 29-Sept. 2	Lexington, KY

* This table lists some, but not all, upcoming Purina-sponsored dog shows.

Pro Club Increases the Point Value of Some Dog Foods & Adds FortiFlora

Purina Pro Club recently increased the Purina Points members receive when they submit weight circles from some *Purina Pro Plan* brand dog foods and *Purina Veterinary Diets* brand therapeutic canine formulas. In addition, *Purina Veterinary Diets* FortiFlora brand canine nutritional supplement has been added to the list of products eligible for Purina Points.

Effective Jan. 1, 2013, submission of weight circles from all *Purina Pro Plan* dog food formulas became 12 points per pound and *Purina Veterinary Diets* canine formulas increased to 13 points per pound. Weight circle submissions from FortiFlora, a nutritional supplement available by prescription only that provides dietary management of dogs with diarrhea, are 390 points per box. Until FortiFlora packaging is updated with a *Pro Club* weight circle, acceptable proof-of-purchase will be the UPC code from the bottom of the box or the entire box including the UPC code.

"We are excited to add FortiFlora to the *Pro Club* program," says Lisa Walsh, *Purina Pro Club* Communications Manager.

Don't Forget to Update Your Pro Club Member Profile

Purina Pro Club wants to know more about you. In an effort to update the *Pro Club* member database, *Pro Club* recently sent all members a profile update request via email or the U.S. Postal Service. The update asks for general member information, the types of breeder-enthusiast activities you participate in with your dogs, and your feeding practices. Be sure to log on to your account at www.purinaproclub.com or call 1-777-PRO-CLUB (1-877-776-2582) to update your profile so that you can continue receiving membership benefits from *Pro Club*.

Purina Points Earned for Purina Brand Weight Circles

Brand	Purina Points
<i>Purina Veterinary Diets</i> FortiFlora brand canine nutritional supplement	390 points per box
<i>Purina Veterinary Diets</i> brand therapeutic canine formulas	13 points per pound
<i>Canyon Creek Ranch</i> brand dog food	13 points per pound
<i>Purina Pro Plan</i> (All Formulas)	12 points per pound
<i>Purina ONE</i> (All Formulas)	11 points per pound
<i>Purina Dog Chow</i> , <i>Purina Puppy Chow</i> , <i>Purina Fit & Trim</i> , <i>Purina Active Senior 7+</i> , <i>Purina Little Bites</i> , <i>Purina Moist & Meaty</i>	8 points per pound

A new *Pro Club* Dog Weight Circle Submission & Reward Order Form that reflects the changes is available online at https://purinaproclub.com/Content/Download/Dog_Weight_Circle_Form.pdf or by calling 1-877-PRO-CLUB (1-877-776-2582) between 7 a.m. and 5 p.m. CDT Monday through Friday.

Weight circle submissions are processed as Purina Points that can be redeemed for items from the *Pro Club* Member Rewards Brochure, Purina dog food checks, or veterinary checks payable to a veterinarian, veterinary hospital or clinic. Using the Weight Circle Submission & Reward Order Form to submit weight circles is required and also helps speed up the processing of weight circles.

Reminders from Pro Club

Pro Club members should be aware of the following:

- *Purina Pro Club* is not a program for institutional organizations, such as rescue groups, humane societies or animal shelters.
- Any retail sale or purchase –

including Internet transactions – of *Purina* and *Purina Pro Club* materials is a violation of program terms and conditions. This includes, but is not limited to, the selling or buying of Puppy Starter Kits and weight circles.

- *Pro Club* is not responsible for fraudulent weight circles. Submitting fraudulent weight circles is a violation of the *Pro Club* program terms and conditions.

- Purina reserves the right to terminate membership or remove or disqualify earnings for any violation of account or program terms ■



Certify Weight Circles

Purina Pro Club recommends that you mail your weight circles by certified first-class mail or other traceable delivery method. This helps to ensure proof of delivery in the event *Pro Club* does not receive your weight circles. *Pro Club* is not responsible for weight circles not in its possession.

PURINA Pro Club Dachshund Update

Scan this QR code on your smartphone to visit www.purinaproclub.com for your Purina Points Summary and detailed account activity. You also may call 1-877-PRO-CLUB (1-877-776-2582).



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