Almost as soon as Dawn DiBari brought “Sunshine” home, she knew something was wrong with the 4-year-old Miniature Long-haired Dachshund’s vision. The dog took a long time to focus his eyes, and he gravitated to the walls of rooms instead of the middle — sure signs he couldn’t see well.

“I was told he was shy, but I could tell by the way he looked at me there was a problem,” says DiBari of West Palm Beach, Fla. “If I went down to the floor instead of standing, it seemed he could see me and would respond.”

DiBari decided to have Sunshine tested for genetic eye disease. Less than a month after buying the Dachshund, DiBari learned that Sunshine has a gene mutation that puts him at risk for developing progressive retinal atrophy (PRA). PRA is an inherited eye condition. Eight different forms of the disease have been discovered, but more are likely to exist. A progressive disease that usually leads to blindness, PRA affects both eyes simultaneously. Unfortunately, there is no treatment, no cure and no way to stop or reverse the damage.

The good news about PRA is that dogs adapt well, and the disease is painless. Since the disease generally progresses slowly, dogs are able to compensate for vision loss with their acute hearing and olfactory senses. Owners who keep furniture in fixed locations help their dogs stay mobile and independent.

Difficult to Distinguish

PRA has been diagnosed in Miniature and Standard Dachshunds of Smooth, Longhaired and Wirehaired varieties. The different sizes and coat varieties of the seventh most popular breed in the United States puts them at risk for PRA. Vets believe it is a problem in several breeds of dog as well as mixed breeds and cats, says Acland, who has been studying PRA for decades. Some breeds appear to be breed-specific, while others affect several breeds.

In Dachshunds, the genetic mutation for cone-rod dystrophy 1-PRA was discovered by researchers at the Animal Health Trust in Suffolk, England. This form of PRA affects Miniature Long-haired Dachshunds — like Sunshine — as well as Miniature Smooth Dachshunds and English Springer Spaniels.

The mutation was found in the RPGRIP1 gene, which codes for a key protein in photoreceptor cells. The genetic test for cord1-PRA was developed in 2007 and is available through U.S. genetic test laboratories as well as the Animal Health Trust. Cord1-PRA recently was also detected in Miniature Wirehaired Dachshunds via testing at VetGen veterinary genetics service in Ann Arbor, Mich. Crossbreeding between varieties contributes to the disease spreading to other varieties, says Robert Oechel, chief scientific officer at VetGen.

The mutation for cone-rod dystrophy PRA in Standard Wirehaired Dachshunds was discovered in 2008 by researchers at the Norwegian School of Veterinary Science in Oslo, Norway. A deletion in the gene nephroretinin or NPHP4, results in a truncated protein that affects other proteins in the retina.

“The cord1-PRA and cone-rod dystrophy PRA vary considerably in the age of onset and rate of progression,” says Acland. “We believe it is possible there may be different forms of cord1-PRA. Although cord1-PRA is associated with the RPGRIP1 gene mutation, it is not necessarily caused by the same form of PRA.”

Breeding Implications for Cord1-PRA* in Dachshunds

<table>
<thead>
<tr>
<th>Normal/Clear</th>
<th>Carrier</th>
<th>Affected</th>
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<tbody>
<tr>
<td>All Normal/Clear</td>
<td>50% Normal/Clear 50% Carrier</td>
<td>All Carrier</td>
</tr>
<tr>
<td>Carrier</td>
<td>50% Normal/Clear 50% Carrier</td>
<td>25% Normal/Clear 25% Carrier 50% Carrier 50% Affected</td>
</tr>
<tr>
<td>Affected</td>
<td>All Carrier</td>
<td>50% Carrier 50% Affected</td>
</tr>
</tbody>
</table>

* Cord1-PRA has an autosomal recessive form of inheritance, thus an affected dog receives a copy of the gene mutation from both his sire and dam.
Pathogenesis & Genetic Testing

Progressive retinal atrophy is a disease-causing degeneration of the retina, the tissue at the back of the eye that converts light into electrical impulses. These impulses are sent to the brain and interpreted as images. The retinal tissue is made up of light receptor, or photoreceptor, cells called rods and cones. Rod cells function in low light by detecting shapes and motion. Cone cells operate in bright light, perceiving definition and color.

Cord1-PRA Genetic Testing continued from page 1

by it. In fact, the cord1-PRA test can yield false positive results.”

Dachshunds may even be affected by other forms of PRA, Acland con-
tinues. “PRA has been observed in several Dachshunds of all varieties
that is not associated with the RPGRIP1 mutation, the NPHP4 mutation or the
prcd (progressive rod cone degenera-
tion) mutation that causes PRA in
many other breeds,” he says. “These
cases may represent one or more
disease-causing mutations. My labo-
atory and those of many of my col-
leagues are working to identify as
many of the genetic causes for PRA
in dogs as possible.”

Genetic testing is key to reducing
the incidence of PRA, although at this
time a genetic test is only available for
cord1-PRA in Miniature Dachshunds.
Genetic testing of dogs before breed-
ing can help limit the production of
 carriers or affected with PRA will
be bred with tested clear dogs. Their
offspring also should be tested before
being bred.

Testing of dogs at risk of being
 carriers or affected with PRA will
allow breeders to rapidly eliminate
the risk of producing affected dogs
and gradually remove causative muta-
tions from the gene pool,” Acland
explains. “If a two or three generation
approach is undertaken, then elimina-
tion of a disease can be achieved with-
out losing valuable breeding lines.”

As DiBari wrote on a Web page
dedicated to Sunshine, “I don’t want
anyone to go through what Sunshine
and I are going through.”

Testing for Cord1-PRA

Dogs with PRA experience a pro-
gressive loss of photoreceptor cells.
In rod cone dystrophies, rod cells are
generally affected first, causing loss
of night vision. As the disease pro-
gresses, cone cell function diminishes,
eventually leading to complete blind-
ness. With cone rod dystrophies, cones
are lost earlier. Some forms of
PRA cause photoreceptor cells to
develop abnormally.

An eye examination that includes
an ophthalmoscopy and electroneutri-
togram can detect PRA, although usually not
until after signs appear. In an ophthal-
moscopy, a veterinarian uses an instru-
ment to examine the retina and look
for late stages of PRA. An electroneuti-
rogram (ERG), which is performed when
a dog is under anesthesia, measures
electrical signals from the retina and
is used for diagnosing early PRA.

Clinical signs of disease include a
decrease in the size and number of retinal
blood vessels and changes in
reflectivity of the eyes. Breeds at risk
for eye diseases, such as PRA, should
have Canine Eye Registration Founda-
tion (CERF) tests prior to breeding.

Board-certified veterinary ophthamol-
ologists perform CERF eye tests, which
cover 25 conditions and diseases.
The many forms of PRA combined with
other potential causes of vision loss can
diagnose disease difficult. Some
dogs with PRA have been known to
develop cataracts, which can be mis-
takenly diagnosed as the cause of a
vision deficit. The unpredictable cause
of PRA makes it easy to unknowingly
breed a dog with the disease.

Genetic testing is key to reducing
the incidence of PRA, although at this
time a genetic test is only available for
cord1-PRA in Miniature Dachshunds.
Genetic testing of dogs before breed-
ing can help limit the production of
 carriers and affected dogs.

Shannon Glines of Bellaluna Dach-
shunds in Atascadero, Calif., had a
cord1-PRA test performed on her fin-
ished conformation champion, “Jack,”
a Miniature Longhaired Dachshund.
When positive test results came back,
Glines changed her plans for breeding.

Experts advise breeders that carrier
and affected dogs can remain in the
gene pool to help maintain genetic
diversity and desirable characteristics;
however, these dogs only should be
bred with tested clear dogs. Their
offspring also should be tested before
being bred.

Testing of dogs at risk of being
 carriers or affected with PRA will
allow breeders to rapidly eliminate
the risk of producing affected dogs
and gradually remove causative muta-
tions from the gene pool,” Acland
explains. “If a two or three generation
approach is undertaken, then elimina-
tion of a disease can be achieved with-
out losing valuable breeding lines.”

Jack had a CERF examination last
summer and was cleared of signs of
PRA. The result gives Glines hope.
“Perhaps Jack will be at risk but never
truly affected,” she says.

Meanwhile, DiBarri’s male Miniature
Longhaired Dachshund Sunshine is
not so lucky. His CERF test revealed
signs of PRA. “His CERF test revealed

Send Us Your Questions

Have questions about your Purina
Points or how to redeem weight circles
for rewards and rebate checks? Con-
tact Purina Pro Club at 877-PRO-CLUB,
or 877-776-2582, between 7 a.m. and
5 p.m. Central time Monday through
Friday. You also may visit www.purina
proclub.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 e-mail at
today’sbreeder@purina.com.

Owners May Submit

Owners of Dachshunds diag-
nosed with progressive retinal
atrophy (PRA) are encouraged to
submit blood samples for genet-
ic research under way at the
Cornell University Baker Institute
for Animal Health. For informa-
tion, please call 607-256-5600.

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

Have comments about Purina
Points or how to redeem weight circles
for rewards and rebate checks? Con-
tact Purina Pro Club at 877-PRO-CLUB,
or 877-776-2582, between 7 a.m. and
5 p.m. Central time Monday through
Friday. You also may visit www.purina
proclub.com to review and redeem
Purina Points.
A variety of new sports clothing and outdoor gear is featured in the Purina Pro Club Member Rewards program. Altogether more than 50 rewards, including merchandise and gift cards, are offered exclusively to members of Purina Pro Club.

The selection, tailored for breeder-enthusiasts who compete in canine sports, includes a wide range of items. The updated Pro Club Member Rewards brochure is available online at www.purinaproclub.com.

Among the new clothing items are a Nor’easter waterproof rain suit, work jacket, heavyweight parka, down jacket and waterproof adventure jacket. The down jacket, which is filled with duck down and waterfowl feathers, can be zipped into the adventure jacket or heavyweight parka for added warmth. An outdoor fleece jacket, ladies’ soft shell jacket and microfleece jacket, full-zipper hooded sweatshirt, and reversible vests are new as well. All the clothing items are embroidered with either the Purina Pro Plan or Chosen By Champions logo.

New outdoor gear items include a deluxe, weather-resistant outdoor chair on a lightweight steel alloy frame. The chair comes in red with the Purina logo and in black with the Purina Pro Plan logo. Made of sturdy aluminum and weighing 12 pounds, the chair has a mesh back for comfort and ventilation. A new red-and-black Purina logo golf umbrella, with a 64-inch arc and rubberized handle, is also available.

Pro Club members can choose from a variety of restaurant and retail gift cards and gift certificates through the Member Rewards program. Several styles of Garmin® GPS tracking systems are available, including a dog-tracking system. A Pro Plan agility wing jump and Purina pop-up tent are also offered. In addition, Pro Club members may redeem Purina Points for veterinary checks and Purina brand dog food checks. Members may choose items from the Member Rewards brochure by redeeming Purina Points earned from submissions of weight circles from packages of participating Purina brand dog foods. Weight circles are the colored circles on dog food packages. Only weight circles, not UPC codes, are valid for credit to a member’s Pro Club account.

To be eligible for membership in Purina Pro Club, one must personally care for five or more dogs and/or breed one litter of puppies a year and live in the United States. Only one membership per household is allowed. Dog food bought must be fed to dogs personally owned or cared for by the Pro Club member. Pro Club is not a program for institutional organizations, such as rescue groups, humane societies or animal shelters.

For information about Purina Pro Club or the Member Rewards program, you may access your account online at www.purinaproclub.com or call member services toll-free at 877-PRO-CLUB or 877-776-2582 between 7 a.m. and 5 p.m. Central time.

Pro Club Policy on Blocked Calls

Purina Pro Club customer service representatives may not be able to reach you if your phone does not accept blocked calls. If you have called Pro Club on an issue expecting a telephone response, Pro Club may not be able to respond. The issue resolution will be entered in your account. When you call again, a representative will be able to share the information.
New Pro Plan Champions Cup Offers Cash Prize & Cruise to Winner

The winner of the 2010 Pro Plan Champions Cup will receive a $10,000 cash prize and a trip for two on next year’s K-9 College Cruise to the Caribbean. Cash prizes also will be awarded to the second, third and fourth place finishers.

“The Pro Plan Champions Cup was introduced 10 years ago to honor those who promote excellence in the sport of purebred dogs through conformation dog shows and to support the dog fancy,” says Ann Viklund, Purina Director of Breeder-Enthusiast Marketing. “We are very excited to expand to a yearlong program that includes all Purina-sponsored all-breed dog shows.”

Previously, the Pro Plan Champions Cup was awarded to the dog earning the most points at three select Purina-sponsored benched dog shows. Now, nearly 200 all-breed dog shows are included. At the end of 2010, points will be tabulated based on the following:

- Best in Show, 5 points;
- Group One, 4 points;
- Group Two, 3 points;
- Group Three, 2 points; and
- Group Four, 1 point.

The dog earning the most points will win the $10,000 cash prize, K-9 College Cruise and a keepsake Pro Plan Champions Cup crystal trophy. A permanent Pro Plan Champions Cup will be displayed at the new Purina Event Center along with a plaque engraved with the winners’ names. The Event Center opens in fall 2010.

Cash prizes will be awarded to the top-placing dogs as follows:

- Second place, $5,000;
- Third place, $2,500; and
- Fourth place, $1,250.

More information about the 2010 Pro Plan Champions Cup and a running tabulation of individual dogs’ points will be available in early March on the Purina Pro Club Web site. Visit www.purinaproclub.com for information.

The Pro Plan Champions Cup is sponsored by Purina Pro Plan brand dog food.

Get Connected to Pro Plan on Facebook

A new Purina Pro Plan for Professionals Facebook fan page allows breeders and enthusiasts to connect using the popular social networking site. Fans can post photos, videos and experiences, and share insights about breeding, handling and other topics.

Go to www.facebook.com/PurinaProPlanforProfessionals to become part of the conversation and share your passion for the sport with a community of dog enthusiasts.

### Purina-Sponsored Sporting Events

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Location</th>
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<tbody>
<tr>
<td>National Shooting Dog Championship</td>
<td>Feb. 1 to 8</td>
<td>Hoffman, NC</td>
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<tr>
<td>National Championship</td>
<td>Feb. 14 to 27</td>
<td>Grand Junction, TN</td>
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<tr>
<td>National German Shorthaired Pointer Association (NGSPA) National Championship</td>
<td>Feb. 25 to March 7</td>
<td>Booneville, AR</td>
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<tr>
<td>Southeastern Championship</td>
<td>Mar. 1 to 14</td>
<td>Albany, GA</td>
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<tr>
<td>American Rabbit Hound Association (ARHA) Little Pack World Hunt</td>
<td>Apr. 8 to 11</td>
<td>Booneville, IN</td>
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<tr>
<td>Grand National Grouse &amp; Woodcock Invitational</td>
<td>Apr. 14 to 16</td>
<td>Gladwin, MI</td>
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<tr>
<td>Purina Outstanding SPO (Small Pack Option) Beagle Award/AKC SPO National</td>
<td>Apr. 16 to 19</td>
<td>Morgantown, KY</td>
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<tr>
<td>Hunting Retriever Club (HRC) Spring Grand</td>
<td>Apr. 17 to 21</td>
<td>Baton Rouge, LA</td>
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*This table lists some, but not all, upcoming sporting events sponsored by Purina.