Research of Canine Diseases Helps to Advance Treatments & Understanding

Researcers studying canine diseases are helping to advance treatments that potentially will offer dogs a better prognosis. Here, we highlight research using stem-cell therapy to treat dogs with spinal cord injuries; two studies focusing on chronic active hepatitis (CAH); and research defining heat stress in brachycephalic breeds.

Stem-Cell Study Aids Spinal Cord Injuries
A three-year clinical trial at North Carolina State University College of Veterinary Medicine is evaluating stem-cell treatment options for dogs with spinal cord injuries. The participants are paraplegic dogs with Grade 5 injuries, which are considered the worst cases. These dogs have complete paralysis with a lack of sensation to their hind limbs.

One participant in the study is a Cocker Spaniel mixed breed named "Tobi," who suffered from intervertebral disc disease (IVDD), a degenerative disc disorder. Owner Beverly Tucker of Thomasville, N.C., took Tobi to an emergency veterinary clinic when it was evident he had lost the use of his hind legs. Despite having surgery, Tobi was unable to feel pain in his hind end, much less use his back legs.

"The veterinarian told us that if the surgery wasn't successful, it was likely Tobi would be paralyzed from the waist down," Tucker says.

Breeds that are genetically predisposed to IVDD develop Type 1 disease. These long-backed, short-legged dogs classically develop signs of IVDD from 4 to 6 years of age, although it can occur anytime from 2 years of age and older. Chondrodystrophy breeds prone to IVDD are: Cocker Spaniel, Dachshund, Pekingese, Lhasa Apso, Shih Tzu, Basset Hound, Beagle, Poodle, and Pembroke and Cardigan Welsh Corgis.

In her efforts to help Tobi, Tucker learned about the clinical trial at North Carolina State University directed by Natasha Olby, VetMB, Ph.D., DACVIM, professor of neurology. The study is funded by the Morris Animal Foundation. There is no cost to participate, but owners must agree to transport their dog to the veterinary school for treatments and evaluations.

Olby’s study, currently in the first year, involves evaluation of 30 paraplegic dogs following one of three treatments. She is recruiting 10 dogs a year. Five small-breed dogs, including Tobi, have been treated thus far. The treatments are:

- Injection of stem cells and Schwann cells into the spinal cord injury site coupled with an infusion of inosine, a substance with neuroprotective properties. The cells are suspended in an artificial cerebrospinal fluid (CSF) that contains nutrients to help support the cells.
- Inosine infusion only
- Injection of artificial CSF only

Stem cells have the ability to rapidly multiply and to take on the function of specialized cells by assimilating various functions.

The treatments are:

- Injection of stem cells and Schwann cells following one of three treatments. She is recruiting 10 dogs a year. Five small-breed dogs, including Tobi, have been treated thus far.

The treatments are:

- Injection of stem cells and Schwann cells into the spinal cord injury site coupled with an infusion of inosine, a substance with neuroprotective properties. The cells are suspended in an artificial cerebrospinal fluid (CSF) that contains nutrients to help support the cells.
- Inosine infusion only
- Injection of artificial CSF only

Though Tobi still uses a cart to go outside and to stand up when eating, Tucker is pleased with the results of his treatment. "He can move his legs more and can push his feet forward a little," she says.

Owners of dogs with Grade 5 spinal cord injuries with complete paralysis are eligible to participate in the clinical trial. For information, please contact Olby at ivddstudy@lists.ncsu.edu.

Two Studies Focus on CAH
Owners of dogs diagnosed with chronic active hepatitis (CAH) commonly describe early signs of the disease — poor appetite, intermittent vomiting and lethargy — that could fit several disorders. Many times, owners do not learn their dog has CAH until the disease progresses to a severe condition.

While the prevalence of the disease in Poodles is not known, clinicians and genetic researchers are finding that Standards appear to be susceptible due to the disproportionate number brought to veterinary clinics for care. Believed to be a heritable condition, veterinarians caution breeders not to breed affected dogs.

"We’re still in the infancy of evaluating this disease in Standard Poodles," says David Twedd, D.V.M., DACVIM, professor of small animal medicine at Colorado State University College of Veterinary Medicine. "We believe that Standards have a higher risk than Toy or Miniature Poodles and than other breeds. We just don’t know what it is."

Funding support from the Poodle Club of America Foundation is helping Twedd to characterize CAH in Standards, Continued on page 2
with a goal of developing an effective treatment. As Twedt and veterinary resident Allison Bradley, D.V.M., continue to collect tissue samples from affected dogs, they are optimistic that they will learn more about the disease and what causes it.

Chronic active hepatitis is ongoing inflammation of the liver that results in progressive damage to liver cells. Eventually scar tissue overtakes healthy liver tissue, leading to liver failure and death. Based on their clinical studies, Twedt and Bradley speculate that some dogs with CAH respond well to immunosuppressant therapy, or medications that reduce inflammation or suppress the immune system. “We’ve had some preliminary success using cyclosporine to treat dogs with CAH,” Twedt says. “It is an immune-suppressing drug that has been shown to stop the ongoing inflammation. Cyclosporine has an advantage over corticosteroids as it has fewer side effects, although a disadvantage is it is more expensive.”

Stem-cell therapy may provide a future treatment alternative. Researchers at the Center for Regenerative Medicine at Colorado State University already are experimenting with implanting new liver cells derived from stem cells in patients with liver disease or damage. “We have harvested stem cells, and we’re trying to make them into hepatocytes or hepatocyte precursors,” explains Twedt. “Stem cells may actually generate new liver cells. They may also have an effect in decreasing inflammation. We are still quite a ways from clinical application in individual dogs.”

Geneticist Mark Neff, Ph.D., director of the Program for Canine Health and Performance at the Van Andel Institute in Grand Rapids, Mich., is collecting DNA samples from all varieties of affected Poodles to study the inheritance pattern. The goal of identifying a linked marker potentially could lead to identification of the causative gene mutation. Neff thinks Standard Poodles are likely to have a genetic predisposition to CAH based on breed predilection. “It is possible the gene has penetrated to C AH based on breed predilection. Many dogs with CAH have, we’re seeing a couple of regions in the genome that look like they are strong for the mutation. To learn whether there is a real positive association or to eliminate it as a false positive comes down to needing more samples. As few as 12 new cases could make a substantial difference in our findings.”

For information about participating in Twedt and Bradley’s research, please contact them at 970-297–5000 or by email at david.twedt@colostate.edu or allison.bradley@colostate.edu. For information about Neff’s research, you may reach him by phone at 970-234–5000 or by email at mark.neff@vai.org.

**Monitoring Brachycephalic Stress**

Most breeders and owners of brachycephalic breeds are aware of the signs of respiratory distress and their breed’s increased susceptibility to heat stress. Unlike dogs with conventional faces, brachycephalic breeds have shortened facial bones without the same proportionate shortening of the overlying soft tissues. The excess soft tissue makes them prone to upper airway obstruction that compromises their ability to take in air. Their inefficient panting and inability to cool down can result in inflamed, swollen airways that lead to a more severe obstruction and further overheating.

Recent research by Michael Davis, D.V.M., professor of physiological sciences and director of the Comparative Exercise Physiology Laboratory, Oklahoma State University, showed that a dog’s body condition score has an even greater impact on thermoregulation, or the ability to maintain a steady body temperature, than does being a brachycephalic breed. The AKC Canine Health Foundation and several parent clubs helped to fund the research.

“Brachycephalic dogs are at greater risk for heat-related illness, presumably due to the structure of their respiratory tract,” Davis explains. “Dogs rely on the respiratory tract to dissipate metabolic heat, and this process is hampered in brachycephalic breeds due to their airway anatomy.”

The study confirmed that other factors should be considered as well. “While brachycephaly had an important impact on our research results, body condition score seemed to have a larger impact,” Davis says. “In other words, being overweight is probably more risky than being brachycephalic and a lean brachycephalic dog may not have that much of a risk. The overweight brachycephalic dogs had two strikes against them.”

While it is well-known that brachycephalic breeds are at risk of overheating during exercise and in warm climates, the parameters in which they are able to achieve homeostasis, or maintain physiological stability, have not been understood. Davis and his research team set out to identify those parameters.

Their study included 200 dogs — 100 brachycephalic dogs and 100 size-matched nonbrachycephalic dogs. Among the brachycephalic breeds were Boxers, Boston Terriers, English and French Bulldogs, Pugs, Japanese Chins, and Shih Tzu. Ten to 20 dogs of each breed were examined.

Using a whole-body plethysmograph, a custom-built box similar in size to a dog crate with rapid, sensitive pressure, temperature and humidity sensors, the researchers were able to detect and measure the impact of temperature and humidity changes on dogs by assessing their breathing patterns. The heat stress levels used in the study were based on the maximum allowed by the U.S. Department of Agriculture (USDA) for dogs being transported by commercial airlines. The research showed that under mild heat stress conditions — 33 degrees Celsius (91.4 degrees Fahrenheit) and 62 percent relative humidity — the brachycephalic dogs were close to overheating. As the intensity of heat stress increased from a normal room temperature, defined as 22 degrees Celsius (71.6 degrees Fahrenheit) and 62 percent relative humidity, to mild heat stress conditions, the brachycephalic dogs overheated sooner than the nonbrachycephalic breeds. Only a few obese brachycephalic dogs in our study could not handle the mild heat stress conditions, and they would be in jeopardy if they were transported under those conditions,” Davis says. “More dogs would be in jeopardy if conditions managed to exceed USDA guidelines.”

Most enthusiasts who are drawn to brachycephalic breeds realize it is important to take precautions against heat and humid conditions. Thanks to the research of Davis and his team at Oklahoma State University, more is known today about the parameters that define the risk of heat stress. Keeping brachycephalic dogs in ideal body condition goes a long way to help prevent respiratory problems. ■

**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.
Purina-Sponsored Sporting Events*  
June to August 2012

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Kennel Club (PKC) National Championship</td>
<td>June 7-9</td>
<td>Lawrence, TN</td>
</tr>
<tr>
<td>Purina All-Age &amp; Top Shooting Dog Awards</td>
<td>June 8-9</td>
<td>Pittsburgh, PA</td>
</tr>
<tr>
<td>Hunting Retriever Club Annual Meeting</td>
<td>June 8-10</td>
<td>Memphis, TN</td>
</tr>
<tr>
<td>AKC National Amateur Retriever Championship</td>
<td>June 16-23</td>
<td>Cheboygan, MI</td>
</tr>
<tr>
<td>Mid American Brace Gundog Federation Awards</td>
<td>July 6-7</td>
<td>Henryville, IN</td>
</tr>
<tr>
<td>US Complete Shooting Dog Association Annual Meeting</td>
<td>July 17</td>
<td>Pinehurst, NC</td>
</tr>
<tr>
<td>PKC Breeders Showcase</td>
<td>July 26-27</td>
<td>Aurora, KY</td>
</tr>
<tr>
<td>National Bird Hunters Association Annual Meeting</td>
<td>Aug. 11</td>
<td>Kansas City, MO</td>
</tr>
<tr>
<td>Montana Shooting Dog Championship</td>
<td>Aug. 23-27</td>
<td>Circle, MT</td>
</tr>
<tr>
<td>UKC Autumn Oaks</td>
<td>Aug. 31-Sept. 1</td>
<td>Richmond, IN</td>
</tr>
</tbody>
</table>

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

---

Purina Pro Plan Introduces Canine Performance Training Treats

Dog trainers and handlers realize firsthand the importance of using food rewards to motivate dogs to perform at their best. Purina Pro Plan is launching Pro Plan brand Dog Snack Training Treats, a bite-sized, soft treat, to help trainers achieve top performance. Made with 80 percent chicken breast, Pro Plan Training Treats are highly palatable to help a dog stay focused on his game. Importantly, each treat is about 3 calories to help owners reward their dogs without overloading them with excess calories. Uniquely designed for training, Training Treats are easy to tear for quick rewards.

Pro Plan Training Treats are formulated without corn, wheat, artificial colors or flavors. The treats will be available in June at pet specialty and farm supply stores. For more information, visit www.proplan.com or to talk to a pet nutrition consultant, call 800-PRO-PLAN or 800-776-7526, from 9 a.m. to 4 p.m. Central time Monday through Friday.
CH Wymoor Champagne Supernova, a 5-year-old English Springer Spaniel campaigned by professional handler Robin Novack of Jackson, Mich., is leading the Pro Plan Champions Cup standings with 123 points earned through April 30.

The No. 4 dog in the country, "Peyton," was bred by Billie and Charlie Kerfoot of Vinton, Va., Erin Kerfoot of Yakima, Wash., and Ruth Kirby of Earleton, Fla. He is owned by Beth Fink of Medina, Ohio, Cecie Florence of Southern Shores, N.C., Erin Kerfoot, Ken Goodhue-McWilliams of Norco, Calif., and Delores Strong of Farmington, Mich.

The winner of 22 Bests in Show, Peyton recently outperformed more than 2,500 dogs to win the Atlanta Kennel Club Dog Show in Perry, Ga., and he captured a Sporting Group Three at the Westminster Kennel Club Dog Show. In 2011, Peyton won the English Springer Spaniel Field Trial Association National Specialty and Best of Breed at the AKC National Championship. In June 2011, he became the second dog in history to win back-to-back Bests of Breed at the Eastern English Springer Spaniel Club Specialties.

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 in 2012. Three-year-old Black Cocker Spaniel GC H Casablanca’s Thrilling Seduction took top honors in last year’s program. This year’s winner will be announced in early 2013.

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 also will be awarded to the top-placing dogs 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.

### 2012 Pro Plan Champions Cup Standings

<table>
<thead>
<tr>
<th>Dog</th>
<th>Breed/Variety</th>
<th>Points Earned*</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCH Wymoor Champagne Supernova</td>
<td>English Springer Spaniel</td>
<td>123</td>
</tr>
<tr>
<td>GCH Mt. View’s Ripsnorter Silver Charm</td>
<td>German Wirehaired Pointer</td>
<td>114</td>
</tr>
<tr>
<td>GCH Szumerias Wildwood Silver Six Pence</td>
<td>Kuvasz</td>
<td>82</td>
</tr>
<tr>
<td>GCH Starline’s Chanel</td>
<td>Whippet</td>
<td>77</td>
</tr>
<tr>
<td>GCH Babheim’s Captain Crunch</td>
<td>German Shepherd Dog</td>
<td>71</td>
</tr>
<tr>
<td>GCH Marlex Classic Red Glare</td>
<td>Miniature Pinscher</td>
<td>67</td>
</tr>
<tr>
<td>GCH Banana Joe Van Tani Kazari</td>
<td>Affenpinscher</td>
<td>66</td>
</tr>
<tr>
<td>GCH Afterall Painting The Sky</td>
<td>Wire Fox Terrier</td>
<td>64</td>
</tr>
<tr>
<td>GCH Jaset’s Satisfaction</td>
<td>Standard Poodle</td>
<td>62</td>
</tr>
<tr>
<td>GCH Of Skyline Captain Hook</td>
<td>Skye Terrier</td>
<td>57</td>
</tr>
</tbody>
</table>

*Points earned through April 30, 2012