AMERICAN KENNEL CLUB CANINE HEALTH FOUNDATION
PREVENT TREAT & CURE®

DISCOVERIES

issue 40 • spring 2012

MISSION:
The Foundation is dedicated to advancing the health of all dogs and their owners by funding sound scientific research and supporting the dissemination of health information to prevent, treat and cure canine disease.

UPDATE FROM THE CEO

Update from the AKC Canine Health Foundation CEO, Terry T. Warren, PhD, JD

Welcome to a redesigned *Discoveries*! We are excited to introduce this new, updated, easier to navigate quarterly newsletter full of information for the breeder, the scientist and our pet-loving community. We are committed to bringing all of our supporters quality content highlighting the AKC Canine Health Foundation's mission "to advance the health of all dogs and their owners by funding sound scientific research and supporting the dissemination of health information to prevent, treat and cure canine disease."

Look for the specific color-coded tab sections that highlight our program of work: **the green tab, "Canine Health",** brings health-information articles on a wide variety of subjects concerning the prevention, treatment and cure of canine disease; **the blue tab, "Focus on Research",** reports on the sound scientific research that is ongoing; **the gold tab, "Advancing the Mission",** provides an opportunity to spotlight the contributions of our supporters and scientists, and to highlight ways in which you can stay involved and contribute to the Foundation's program of work; **the orange tab, "Update from the CEO",** relays the current news from the Foundation.

We hope you enjoy the newly updated *Discoveries*. Please let us know how you like it!

NESTLÉ PURINA SUPPORT

For those of you who participate in the Nestlé Purina Parent Club Partnership Program and clip weight circles, we thank you. On February 13, 2012, because of

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THIS ISSUE AT A GLANCE

Don't forget to register:
BREEDER'S SYMPOSIUM
Saturday, April 21, 2012

To learn more:
www.akcchf.org/news-events

Oh, That Flexible Neck!

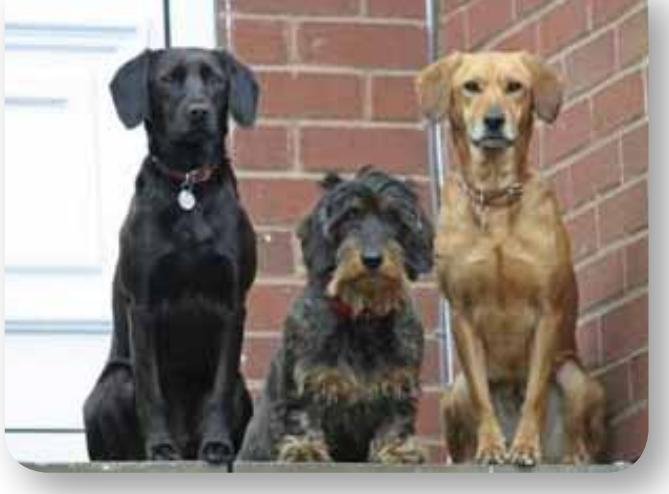
This article is the second in a four-part series. This series is being contributed by Dr. Karen Gellman, DVM, PhD, and Dr. Judith M. Shoemaker, DVM. For more information about Postural Rehabilitation or training for vets, visit: **www.PosturalRehabVets.com**.

In the Winter 2012 issue of *Discoveries*, Drs. Karen Gellman and Judith M. Shoemaker explored posture and why standing up is so important for animals and people. So, what are some of the reasons our dogs have trouble standing comfortably or "stacking" correctly? The upper neck, the feet and dentition/skull shape turn out to be the biggest players in abnormal posture because they are areas rich in nerve cells that report on the body's relationship to gravity, especially that of the head and neck. And they are vulnerable to changes caused by domesticated life. When these anatomic regions become distorted or damaged, the information from their local nerves is also distorted or damaged. Bad information generates bad posture. But there is good news! When you can normalize the information or mitigate its effects, the dog's posture will return to a healthful and neutral stance, like resetting an electronic device to its "factory settings."

incorrect posture

RESTRAINT & FORCE

Aside from carrying ID and vaccination tags, dog collars are mainly used to control a dog's movements: keeping them close on a walk, holding them back from jumping on a houseguest and for training. Why don't we use bracelets or belly bands? Because controlling the neck and head is the most effective method – the animal will always go where its brain goes. There's been awareness in recent years that damage can be caused to the delicate structures of the neck by dogs pulling against their collars. One result is that some of the worst leash-pulling culprits are put into harnesses, some of which are ineffective – so they can really pull their owners around! Another has been the introduction of more sophisticated head collars and better training techniques.



Since head position is critical for all animals, the small muscles that control the head are loaded with sensory nerves that report on position – 500 times more sensors than in limb muscles! The joint capsules and ligaments of the neck vertebrae are also "hard-wired" to provide intensive information about their position. When excessive force is exerted on the neck, whether from a leash, a kennel chain or from an accident, there can be damage to those muscles, joint capsules and nerves. For instance, a dog that always cocks its head to one side could be demonstrating distorted neural information. Sometimes the impairment is more subtle, as in a dog that only retrieves a Frisbee thrown in one direction. Ever known a dog that lies down only on one side to sleep? All animals have to bend their necks in order to get up from lying on their sides. If bending their necks is difficult or painful, dogs will avoid lying down on the side that's hardest to bend away from when rising.

While the most common cause of neck injuries is restraint, some dogs suffer trauma during athletic performance or rough play with their canine friends. Dogs with a strong play or prey drive may successfully suppress signs of a problem at the time of the trauma, but later adapt their posture and gait to compensate for the pain or dysfunction. Their restriction in movement or gaiting can become exacerbated over time, or only revealed in extreme athletic challenges. Meanwhile, compensatory posture can cause overload damage in joints that are inappropriately bearing excessive weight.

JUVENILE INTERVENTION

Some dogs are never quite right from earliest life because of injuries during whelping. The most common example is a very large first-born puppy that causes even a mild dystocia or birthing delay, especially in a primiparous

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SPOTLIGHT ON DISEASE: Hemangiosarcoma

OVERVIEW OF HEMANGIOSARCOMA

Sarcomas are cancerous tumors that arise from the cells of blood vessels, nerves, muscles, connective tissues or fat. Hemangiosarcoma is a particular type of sarcoma that arises from cells lining the blood vessels – especially the smaller arteries and veins. Since hemangiosarcomas involve abnormal overgrowth of blood-vessel tissues, they tend to bleed profusely when cut or disturbed. They are particularly fragile tumors that are prone to rupturing, causing internal bleeding that can be extremely dangerous – and often fatal – to the affected animal.

Unlike some of the other canine sarcomas, hemangiosarcomas are very invasive, fast-growing tumors that often migrate to the spleen, heart, liver, lungs, kidneys, muscle, lymph nodes or skin. Hemangiosarcoma is usually diagnosed using X-rays, ultrasounds, CT scans and tissue biopsies.

SYMPTOMS

Owners of dogs with hemangiosarcoma may notice a number of different symptoms, depending upon where the cancer started and the extent to which it has metastasized. Often, the initial signs of hemangiosarcoma are chalked up to old age, changes in weather or alterations in the dog's living environment.

Initial symptoms may include:

Abdominal pain and distention; lethargy (progressive); depression (progressive); weakness (progressive or intermittent, often with seemingly spontaneous recovery); exercise intolerance (usually mild); lack of appetite (inappetance or anorexia; usually starts mildly and progresses as the cancer spreads); vomiting and diarrhea and weight loss.

As the disease progresses, symptoms may include:

Visible lumps on the legs, head, face, ears, prepuce, muzzle, back, ribs, abdomen, flank area, belly or elsewhere; collapse (usually acute; happens without warning); difficulty breathing (dyspnea; respiratory distress); abnormal heart rhythms (arrhythmias) and/or elevated heart rate (tachycardia); enlarged liver (hepatomegaly) and/or enlarged spleen (splenomegaly); pale mucous membranes (pallor; especially of the gums); excessive formation and excretion of a large amount of urine (polyuria); excessive thirst and intake of water (polydipsia); lameness; limping; swollen joints and sudden death can occur.

CAUSES

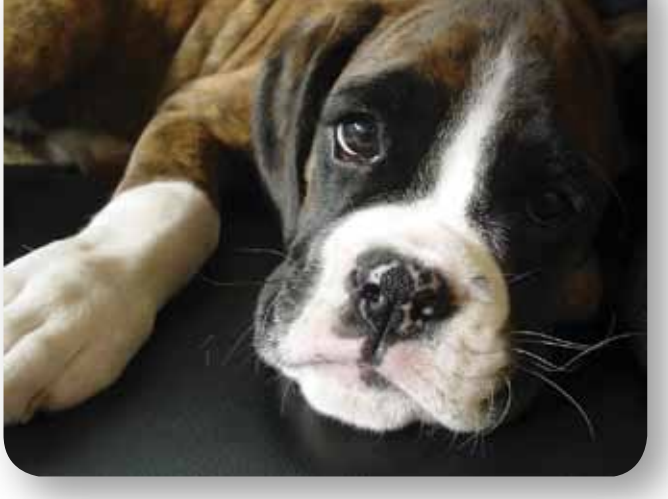
The actual causes of hemangiosarcoma, similar to the causes of most other types of cancer, are not well understood. Hemangiosarcoma of the heart is one of the most common cardiac cancers in companion dogs. Certain breeds such as Boxers, Doberman Pinschers, English Setters, German Shepherds, Golden Retrievers and Labrador Retrievers have shown a more prevalent risk, suggesting a genetic component to its cause; however, all dogs are at risk for developing hemangiosarcoma.

One morning, Einstein, an 8½-year-old Leonberger, failed to make his way upstairs in anticipation of his morning walk. Randy and Teresa Schlaffer instantly knew something was wrong. They went downstairs and found Einstein sleeping in the backyard. Even with their encouragement, Einstein barely moved.

Story continued on page 11

What better way to remember your canine companion than with an engraved brick paver at the Purina Event Center? Not only will your canine friend be memorialized, but by purchasing a brick paver, you also make a contribution to CHF and help fund canine health research. Brick pavers are $100 and $70 from each donation is tax-deductible. To purchase a brick, visit us at **akcchf.org/donate**.

Focus on Canine Cancer Research



Cancer can be a devastating diagnosis for both humans and our beloved canine companions. There are 77.5 million owned dogs in the United States, and one quarter will develop cancer, including those of the bone, breast, pancreas, liver, prostate, lung and skin. Veterinarians report that owners increasingly want to treat their pets rather than just managing their discomfort, but treatment options are limited, and the cost of radiation and chemotherapy can be prohibitive. The AKC Canine Health Foundation is committed to funding studies that will prevent, treat and hopefully cure canine cancers one day. Currently, we are funding 25 OAK grants and 15 ACORN grants that focus on a range of dynamic new options for cancer diagnosis and treatment. Additionally, we are supporting studies that will better define the underlying molecular mechanisms within a cell that cause cancer and identify the specific genes that confer susceptibility to disease. As such, CHF is a leader among a growing network of foundations and organizations that seeks to promote and facilitate canine cancer research.

While canine health is our focus, CHF recognizes that our funded research will also contribute to a better understanding of human cancers. Dr. Heather Wilson, DVM, DACVIM Oncology, Texas A & M College of Veterinary Medicine and Biomedical Sciences, says, "Many drugs and therapies that were tested on laboratory animals and taken straight to human clinical trials failed miserably. It is simply not enough to prove that we can kill cancer in an induced artificial environment such as a laboratory animal." Wilson continues, "Dogs get cancer for the same reasons we do, and they do it with an intact immune system [unlike laboratory mice]. It is important to show that a susceptible cancer pathway or target exists in more than one species."

For these reasons, there is a major initiative underway to promote the collaboration between human and veterinary researchers and clinicians. This initiative, known as One Health (**www.onehealthinitiative.com**), is a movement

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The Future of Canine Cancer Research

What is on the horizon for cancer diagnostics and therapeutics? The AKC Canine Health Foundation currently has an exciting cancer research portfolio. We are particularly enthusiastic about our funding of dynamic new cancer treatment options that will have application to both human and canine oncology.

- **Dr. Nicola Manson of the University of Pennsylvania** has targeted vascular endothelial growth factor (VEGF), which if neutralized could profoundly limit the ability of tumor cells to proliferate and spread.
- **Drs. Julie Ellerhorst and Phillip Bergman of the University of Texas M. D. Anderson Cancer Center and BrightHeart Veterinary Center**, respectively, have chosen inducible nitric oxide synthase (iNOS) as a target. iNOS is thought to be necessary for tumor growth, and iNOS inhibition is a promising therapy for eradication of solid tumors.
- **Drs. Claire Cannon and Jaime Modiano of the University of Minnesota** are focused on a family of proteins called Aurora kinases that regulate cellular division. Aurora kinases are frequently found to be aberrantly overexpressed in cancer cells and are attractive new targets for the development of new anticancer therapies.
- **Dr. Heather Wilson of Texas A&M** is funded by CHF to establish the first genetically engineered anti-lymphoma immune cells ever created in the dog. Dr. Wilson is using gene transfer technology to genetically modify T cells to recognize and kill lymphoma cells. While technically challenging, if her work is successful, it will represent a novel technique that will harness the dog's own immune system to eradicate cancer.

CHF is committed to funding scientists who are focused on canine cancer research. You can help support their cutting-edge efforts by visiting us at **www.akcchf.org/research** and making a donation.

Spring 2012 Champion of Health: Dr. Cindy Otto

Dr. Cindy Otto became interested in the health and safety of search and rescue dogs as a resident in internal medicine and a PhD student in veterinary physiology at the University of Georgia. It was here that she first learned about the Urban Search and Rescue dogs and realized that they had no structure of veterinary support. Once at the University of Pennsylvania, she tracked down the state team, working with them between 1994 and 2010. During this time, she was deployed to assist in the rescue and recovery efforts of Hurricane Floyd and the September 11, 2001, terrorist attacks in Manhattan. "Since my experience with those dogs was so powerful, and the importance of their care so clear, I also joined the Veterinary Medical Assistance Team to be sure I had a mechanism to provide support during disasters," said Otto.

Otto has been monitoring the health and behavior of Urban Search and Rescue canines since October of 2001 through an AKC-CHF funded grant (now in its third renewal). Over the last 10 years, she has monitored canine teams that responded to the September 11, 2001, terrorist attacks in New York and Washington, DC. During the deployments in New York, both at Ground Zero and at the Staten Island Landfill, and in Washington, DC, at the Pentagon, the health and well-being of the dogs were monitored. The most common handler-reported problems were cuts and scrapes, most being minor. While the human responders have been plagued with chronic respiratory conditions, their canine companions (based on the ongoing monitoring) have shown minimal respiratory problems. "The dogs' respiratory systems were able to cope with this horrible insult of the air quality, toxins and pollutants that they were exposed to with no respiratory protection from the work that they did," said Otto. "All of our evidence points to the fact that these dogs were incredibly resilient." Because dogs and humans suffer from many of the same diseases, dogs have been seen as an ideal natural research specimen. "We see a problem in the dog that helps us understand a problem in the human, but now we're going to reverse that," said Otto. "The humans had a problem but the dogs didn't – what's different? That might open up some opportunities for really important investigations in respiratory physiology."

Inspired by her work with search and rescue dogs deployed during the attacks of September 11, 2001, Otto founded the Penn Vet Working Dog Center. Established in 2007, the Center serves as a national research and development center for detection dogs. The goal of the Center is to increase collaborative research, scientific assessment, and shared knowledge and application of the newest scientific findings and veterinary expertise to optimize production of valuable detection dogs.

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Otto's most recent endeavor is the AKC-CAR Detection Dog DNA Bank and Health Registry that will help researchers collect and analyze genetic, behavioral and physical data, and integrate the latest scientific information in order to optimize the success and well-being of detection dogs. The AKC-CAR Search Dog DNA Bank and Health Registry will help search and rescue organizations, law enforcement, breeders and handlers identify factors contributing to the success of these vital dogs.

Because of the extraordinary amount of time required to train and handle a search and rescue dog, Dr. Otto feels that her true calling is helping these exceptional canines as a researcher. "There are all sorts of other areas where we can use dogs and their phenomenal sense of smell to open up new worlds for us," she said.

New Acorn Grants

New ACORN research grants are here. For detailed information about any of these studies, including ways to provide financial support, visit us at **www.akcchf.org**.

Grant 01683-A: Pre- and Intra-Operative Detection and Resection of Cutaneous and Subcutaneous Sarcomas in Dogs Using an Integrated Spectroscopy and Imaging System; Dr. David E. Holt, BVSc, University of Pennsylvania, **$12,960**

Project Goal: The goal of the current proposal is to evaluate an innovative, new handheld intra-operative imaging system that detects probes (dyes) that accumulate within tumors. By using this instrument, surgeons can best identify the extent to which cancerous tissue needs to be removed and will ultimately minimize the chance of recurrence or metastases.

Grant 01684-A: Plasma Cortisol Concentration in Dogs with Pituitary Dependent Hyperadrenocorticism and Atypical Cushing's Syndrome; Dr. Linda Frank, DVM, University of Tennessee, **$11,631.60**

Project Goal: Hyperadrenocorticism, commonly known as Cushing's syndrome, is a hormonal disorder caused by prolonged exposure of the body's tissues to high levels of the hormone cortisol. Atypical Cushing's syndrome is diagnosed when dogs have clinical signs suggestive of Cushing's disease (excessive drinking, infections, hair loss), but increases in peak cortisol concentration are not detected with routine tests. Dr. Frank intends to determine whether atypical Cushing's syndrome is due to continuously increased cortisol production instead of increased peak production. Enhanced diagnosis will lead to enhanced treatment of dogs with this underdiagnosed and debilitating disease.

Grant 01689-A: Investigation of a C-KIT Inhibitor (Palladia®) as a Radiosensitizing Agent in Canine Mast Cell Tumor Cells in Vitro; Dr. Keijiro Shiomitsu, DVM, Louisiana State University, **$12,921.54**

Project Goal: Canine mast cell tumors are the most common cutaneous malignant tumors in dogs. This grant will evaluate the ability of a currently marketed chemotherapeutic, Palladia®, to sensitize tumors to radiation. If Palladia® is a radiosensitizer, it will make radiation more effective for local tumor control and hopefully prolong the life expectancy of radiation oncology patients.

Grant 01692-A: Evaluation Grading Systems for Accurate Prognosis of Canine Cutaneous Mast Cell Tumors; Dr. Barbara J. Davis, VMD, PhD, Tufts University, **$12,960**

Project Goal: In dogs, mast cell tumors (MCT) are one of the most common cancers, comprising up to 21% of all canine skin cancers, and they can vary from easily cured, isolated tumors to fatal metastases. Dr. Davis proposes to identify biological markers (biomarkers) specific to canine cutaneous mast cell tumors that can be used to quantitatively, efficiently and accurately predict tumor behavior. Rapid and accurate diagnosis will allow for effective treatment of canine patients and prevent patients from being unnecessarily subjected to painful and expensive treatments.

Grant 01694-A: Progression of "Silent" Degenerative Mitral Valve Disease in Norfolk Terriers; Dr. Mark A. Oyama, DVM, University of Pennsylvania, **$12,555**

Project Goal: Dr. Oyama has previously identified a population of apparently healthy Norfolk Terriers with a high incidence of degenerative mitral valve disease (DMVD). This "silent" DMVD represents a barrier to early diagnosis and treatment. Dr. Oyama proposes to perform stethoscope and echocardiographic exams to follow disease progression in dogs with "silent" DMVD, with the goal of being able to better characterize disease progression and identify the best technique for early diagnosis and intervention in "silent" DMVD.

Grant 01698-A: Immunohistochemical Quantification of the Transcobalamin II Protein and Receptor in Naturally Occurring Canine Tumors; Dr. Annette M Sysel, DVM, Bauer Research Foundation, **$11,986.74**

Project Goal: Human cancer cells rely heavily on vitamin B-12 for cell growth. In order to acquire vitamin B-12, human cancer cells express more vitamin B-12 receptors on their surface and produce abnormally high levels of transport proteins such as transcobalamin II to scavenge vitamin B-12 for their benefit. Dr. Sysel will evaluate the expression of vitamin B-12 receptors and transcobalamin II in canine tumors. If canine cancer cells express aberrantly high levels of these proteins, then further work can be done to target the vitamin B-12 receptor and transporter protein with anti-tumor drugs.

Grant 01701-A: Opioid Immunomodulation - **$12,960** and **Grant 01712-A:** Tramadol Immunomodulation in Dogs - **$11,510**; Dr. Amy Elizabeth DeClue, DVM, MS, University of Missouri

Project Goal: Opioids are often used to treat pain in dogs, including during the post-operative period when dogs are at greater risk for infection. Despite extensive work in other species supporting the profound effect of opioids on the immune system, there is no published information pertaining to the effects of opioids on immune function in dogs. In this study, Dr. DeClue will evaluate the effects of three of the most commonly used opioids in dogs on immune function. If

opioids are found to impact the canine immune system, this research will advise clinicians to use opioids discriminately when the risk of infection is minimal.

Grant 01703-A: Evaluation of FoxP3+CD25+CD4+ Regulatory T Cells and the CD8/Treg Ratio Via Flow Cytometry Before and One Month After Metronomic Chlorambucil in Dogs with Cancer; Dr. Annette N. Smith, DVM, Auburn University, **$11,372.52**

Project Goal: In dogs with cancer, FoxP3+CD25+CD4+ Regulatory T cells (Treg) prevent the elimination of cancer by suppressing killer immune cells. The goal of this study is to evaluate the effect of metronomic (daily, low dose) chlorambucil on Treg and killer immune cells using flow cytometry, with the hypothesis that metronomic chlorambucil will enhance the killer immune cell/Treg ratio. Confirmation of this hypothesis will enhance the evidence-based treatment options of veterinary oncologists.

Grant 01704-A: Expression and Distribution of Receptor Activator of Nuclear Factor KB Ligand (RANK-L) and Its Receptor RANK in Canine Osteosarcoma; Dr. Bernard Séguin, DVM, MS, Oregon State University, **$12,960**

Project Goal: Canine osteosarcoma is a deadly bone cancer that occurs most often in large and giant-breed dogs such as Saint Bernards, Great Danes, Irish Setters, Doberman Pinschers, Rottweilers, Mastiffs, Golden Retrievers, Bernese Mountain Dogs and Greyhounds. This study will investigate whether osteosarcoma bypasses regulatory growth mechanisms by producing both a growth-stimulating molecule RANK-L and its receptor. If the results are in the affirmative, this study will lay the groundwork for the development of new therapeutic approaches to canine osteosarcoma.

Grant 01708-A: Validation of a General Method for Enrichment of Canine Cancer Stem Cells; Dr. Timothy D. O'Brien, DVM, PhD, University of Minnesota, **$12,960**

Project Goal: Recent research suggests that a specialized group of cells called "cancer stem cells" (CSCs) might play an important role in the development, growth and spread of various malignant tumors in humans. The definitive existence of CSCs in canine cancers remains to be proven and will be necessary to develop cures for cancer. Dr. O'Brien will develop a unique, widely applicable method to enrich those cells that behave like CSCs from canine osteosarcoma, hemangiosarcoma and glioblastoma. Once this technique is in place, further genetic analyses of CSCs will help define targeted therapies that can eradicate CSCs and better control tumor metastasis.

Kudos

Hats off to the **Baltimore County Kennel Club** for their donation of $2,300 to further our mission.

Build-A-Bear Workshop Bear Hugs Foundation shows their support with a $5,000 grant to help dogs live longer, healthier lives.

We acknowledge **Mr. and Mrs. Randy Foster** for their donation of $15,000 to prevent, treat and cure canine disease.

Excellent work **Australian Shepherd Health & Genetics Institute, Inc.,** for their $40,500 contribution towards Grants 1131 & 1615 for cancer and epilepsy research studies.

Our sincere gratitude for the $20,000 donation from **Cora N. Miller,** who continues to support canine health.

Great work **Scottish Terrier Club of America Health Trust Fund** for donating $25,000 to support Grants 1692, 1577 & 1592.

Kudos to the individuals who participated in the **Willem Wijnberg Cancer Fundraiser,** who helped raise over $24,000 for the Berner Lovers' DAF, where $35,000 from the DAF was used to sponsor Grant 1557 for hemangiosarcoma research.

Special thanks to the **Portuguese Water Dog Foundation, Inc.,** for supporting more than $8,000 in research to benefit the breed.

Many thanks to the **Flat-Coated Retriever Foundation** for sponsoring $20,000 towards cancer research studies.

We applaud the **Siberian Husky Club of America Inc.,** for contributing $10,000 to their DAF.

Thank you to the **Irish Setter Club of America Foundation, Inc.,** for their $10,000 contribution towards Grant 1609 for Inflammatory Bowel Disease (IBD).

Oh, That Flexible Neck! *(cont. from page 2)*

or "maiden" bitch. The pressure on the pup's neck can be more than enough to damage its neck or overly compress its skull. This is the puppy that is the biggest in the litter, but the last to open its eyes, walk, run and it always seems a little dopey and uncoordinated. Some puppies can be injured post-birth with large litters, poorly designed whelping boxes or inexperienced bitches. Many of these dogs can be helped with an early juvenile intervention.

If you assess each puppy's ability to initiate and maintain an appropriate relationship with gravity at this critical time, you will often see a wide variation in developmental levels. This is best done between 3-4 weeks of age, when they are able to thermo-regulate on their own and are starting to become mobile, but not walking well yet. This window of time will give the best therapeutic results. Manipulative therapy and Postural Rehabilitation exercises can help train the poorly developed pup to use its body more correctly and more symmetrically. By intervening early, you can give each dog the best possible chance to live up to its potential – turning a dys-coordinated dog into a normal one, or an average dog into a great one.

THE MEANING OF PAIN

We humans give a great deal of meaning to pain, and we have a thriving pharmaceutical industry devoted to pain avoidance. For animals, mild to moderate pain is a physiologic signal that the painful area is damaged and needs to rest and heal. Except under extreme circumstances, it is not possible to completely avoid moving one's neck during normal life processes. If it is not possible to avoid using the damaged tissue, healing will be delayed because both normal wear and tear and the injured parts will need to be repaired. Neutral posture and proper compensation for pain are designed to be the best way to heal. So, there are times when giving your dog pain medication for a limp can cause more harm than good – if you make the pain go away, he will use the leg more and delay healing. It is imperative that the cause of the pain be treated, not just the pain, and that normal posture be restored. Judicious use of pain control is appropriate.

Neck injuries and distorted nerve signals from that area can often be treated effectively with manipulative therapy. By restoring full range of motion and resetting the joint capsule position and receptor function, correct neurologic communication about the dog's head position and support relative to the ground can be re-established. The body puts such a high priority on keeping the brain and brainstem safe that other parts may suffer to accommodate it. It can be surprising how much lameness that appears to be in the hind end is "fixable" with neck treatment only!

FUTURE SEGMENTS:

Feet on the ground – For all terrestrial animals, essential information about their ground surface is transmitted by the feet. Yet, our modern, man-made environment tends to alter the sensitivity of this feedback loop. Even more critically, dogs can get very large distortions in ground perception if their toenails scrape the ground in daily life, leading to postural distortions that are punishing to their joints. How does this mechanism work? And can we fix it when it breaks?

It's more than just bite! – Did you know that more than half of the AKC breed standards allow for a bite other than a scissors bite? It's not just aesthetics we are worried about – malformed dentition and distorted skull shapes have a profound effect on posture and balance. Some simple juvenile interventions can go a long way to helping your dogs have a better bite.

To date, the AKC Canine Health Foundation has provided over $8.2 million for more than 165 canine cancer-related grants.

Learn more about the important work CHF researchers are doing in the field of canine cancer by visiting us at **www.akcchf.org/research/funded-research**. You can sort CHF grants by field of study. From the drop-down menu, choose "oncology" and read detailed descriptions of these grants.

By making a donation to one of the 40 oncology-focused grants currently funded by CHF, you can help researchers in their quest to prevent, treat and hopefully cure canine cancers one day.

UPDATE FROM THE CEO

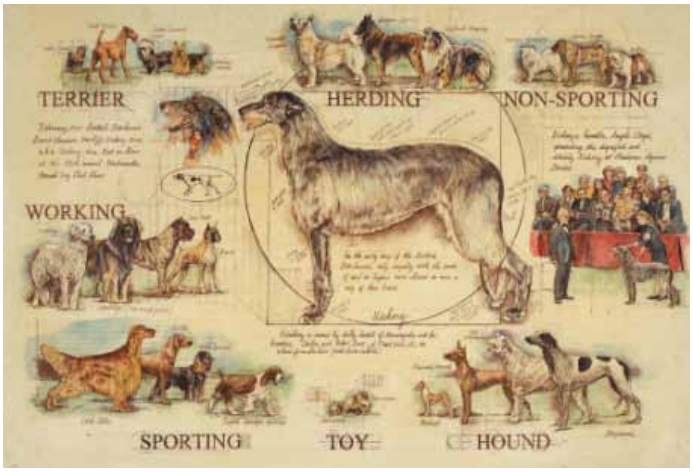
(cont. from page 1)

the efforts made by each of you, Nestlé Purina presented the Foundation with a check in the amount of $227,257. This money has been deposited in the national breed-specific donor-advised fund for the purpose of supporting research. To find out how you can participate in the Nestlé Purina Parent Club Partnership Program and support canine health research, visit **www.PurinaProClub.com**.

PURINA.

WESTMINSTER

The Westminster Kennel Club presented the AKC Canine Health Foundation (CHF) with a check for $10,000 from the proceeds of this year's Westminster Kennel Club dog show poster. We were honored to be the recipient, and we appreciate their support.



LIVING ART CALENDAR

The 2012 Living Art Calendar, a timeless keepsake, is available online for purchase. The lovely photographs of the dogs were featured at CHF's Charity Cocktail Party, which took place during the spectacular week of the Westminster dog show events. We thank all of the dog owners who graciously supported this fundraising calendar project; Tom Grabe and *The Canine Chronicle*; and the contributing photographers, Miguel Betancourt, Susan Ancheta, Lisa Croft-Elliott and Christina Freitag.

NEWS & INFORMATION

May is National Pet Cancer Awareness Month. You can read more about how the Foundation is supporting canine cancer research in this issue of *Discoveries*.

Calendar of Events

April 21:
Breeders Symposium
Colorado State University

New Club Members *(as of 3/1/12)*

The German Pinscher Club of America, Inc.

Greater Sierra Vista Kennel Club

Heart of Ohio Sussex Spaniel Club

Spring is in full bloom, so enjoy the extra daylight whether you are walking your friend at the park, in the dog show ring, around an agility course or out in the field. Take a deep breath, enjoy the sunshine and know that together we are advancing the health of all dogs and their owners! Thank you.

MEET CHF'S CHIEF SCIENTIFIC OFFICER

The AKC Canine Health Foundation (CHF), the most highly regarded organization funding sound scientific research exclusively for dogs, is pleased to announce the appointment of Dr. Shila Nordone, PhD, as its Chief Scientific Officer (CSO). As CSO, Dr. Nordone will be leading the scientific efforts of the Foundation.

"Dr. Nordone brings a wealth of experience to CHF," said Terry Warren, Chief Executive Officer and General Counsel of the AKC Canine Health Foundation. "As a scientist and as a researcher, Dr. Nordone has first-hand experience with hypothesis-driven research and the peer-review process, and she recognizes high-impact research. In addition, as a grant recipient and grant reviewer, Dr. Nordone understands that innovation and fiscal responsibility are not mutually exclusive, but rather must work in tandem to drive success in the discovery of new treatments for our canine companions."

Dr. Nordone, a canine immunologist, comes to CHF with 10 years of experience in research and scientific training. Nordone received her PhD in immunology with a biotechnology minor from North Carolina State University (NCSU).

SPOTLIGHT ON GENETIC TESTS: Cerebellar Ataxia (CA) in the Italian Spinone

Cerebellar ataxia (CA) in the Italian Spinone is a serious neurological disease. In affected dogs, the cerebellum, which is the part of the brain responsible for the coordination of motor movement in the body, becomes diseased. Affected dogs are born normal, but clinical signs, including the development of an unsteady gait, loss of coordination and poor balance, usually appear in the first weeks or months of life. The disease is progressive; symptoms worsen during the first year of the dog's life such that most dogs are euthanized before they are a year old. There is no treatment for the disease.

The disorder shows an autosomal recessive mode of inheritance: A dog has to inherit two copies of the defective gene (one from each parent) for it to be affected by the disease. Dogs with one copy of the defective gene and one copy of the normal gene are called carriers and show no clinical signs but can pass the defective gene on to their offspring. When two apparently healthy carriers are crossed, 25% (on average) of the offspring will be affected by the disease, 25% will be clear and the remaining 50% will be carriers.

The region of the genome that contains the causal mutation has recently been identified at the Animal Health Trust. Using the information gained from this research, they have developed a linkage-based DNA test for the disease, which they estimate will give an accurate result for between 95% and 98% of dogs tested. This test will detect those dogs that are carriers of the CA mutation and those that are clear of the mutation.

Breeders will be sent results identifying their dog as belonging to one of three categories:

CLEAR: The dog has two copies of the normal gene and will neither develop cerebellar ataxia nor pass a cerebellar ataxia gene to their offspring.

CARRIER: The dog has one copy of the normal gene and one copy of the mutant gene that causes cerebellar ataxia. The dog will not develop cerebellar ataxia, but will, if bred, pass the cerebellar ataxia gene to, on average, 50% of its offspring.

AFFECTED: The dog has two copies of the mutant gene that causes cerebellar ataxia and will develop the disease. Carriers can still be bred to dogs that test clear. On average, 50% of such a litter will be clear and 50% carriers; there will be no affected pups produced from such a mating. Pups to be used for breeding can themselves be DNA tested to determine whether they are clear or are a carrier.

Samples submitted should be cheek swabs (a non-invasive sampling method). Test kits are obtainable only from the Animal Health Trust. To order a test kit, visit the Animal Health Trust at **www.aht.org.uk**. Further information can also be obtained by emailing dnatesting@aht.org.uk.

Genetic testing is an important step in maintaining the health of dogs and their offspring. The Canine Health Information Center (CHIC), is a centralized canine health database jointly sponsored by the AKC Canine Health Foundation and the Orthopedic Foundation for Animals (OFA). CHIC, working with participating parent clubs, provides a resource for breeders and owners of purebred dogs to research and maintain information on the health issues prevalent in specific breeds. For more information about CHIC eligibility, obtaining a CHIC number, fees and how to enroll a breed in the CHIC program, visit us at **www.akcchf.org/about-us/alliances**.

FOCUS ON RESEARCH *(cont. from page 4)*

to forge co-equal, all-inclusive collaborations between physicians, osteopaths, veterinarians, dentists, nurses and other scientific-health and environmentally related disciplines. According to Wilson, the One Health approach to canine cancer is the most promising aspect of canine cancer research today, and "Many of the human cancer researchers are finally buying into the canine model of spontaneous disease. These new partnerships allow us to really pursue cutting-edge research in our veterinary patients, benefiting humans and canines alike."

In an effort to further the One Health Initiative, the Texas Veterinary Cancer Registry (TVCR) was recently formed. A joint effort of the CARE Foundation, Baylor University Medical Center (BUMC) at Dallas and the Texas Veterinary Oncology Group, TVCR is an animal care network and registry formed to identify, register, facilitate and promote the medical treatment of pets with cancer. TVCR will collect, compile and analyze crucial information from pet owners and veterinarians about pets that have been diagnosed with various forms of naturally occurring diseases (most often cancer). This information will be used to advance the care and treatment of animals with cancers in the hope of eventually matching animals with relevant clinical studies. For more information about registering your pet, visit **www.texasvetcancerregistry.com.**

Two CHF-funded cancer researchers who see the One Health model as the most promising step in disease research are Dr. Jaime Modiano, VMD, PhD (University of Minnesota), and Dr. Matthew Breen, PhD (North Carolina State University). Drs. Modiano and Breen, along with other colleagues, have supported the formation of the Canine Comparative Oncology & Genomics Consortium (CCOGC), a joint venture funded in part by grants from CHF and Pfizer Animal Health. CCOGC is a canine cancer-tissue bank that researchers around the world can access for research samples. The CCOGC is an important resource for researchers, providing them with small volumes of blood, urine, tumor tissue and samples of corresponding normal tissue. Researchers who are interested in contributing samples to CCOGC can learn more at **www.ccogc.net**. Finally, the Canine Health Information Center (CHIC) remains the gold standard for breed-specific DNA banking (**www.caninehealthinfo.org**). Collectively, these resources can be used to the benefit of both dogs and humans.

As researchers who study canine and human disease gain a broader appreciation for the value of the canine model of spontaneous disease, the door is open for exciting breakthroughs in cancer research. "Canine cancer research allows us access to new therapies that we may not have had access to in the past, with the potential for new veterinary products that are affordable and efficacious," said Wilson. "We need new therapies, we need new drugs and we need to move beyond describing survival times in terms of months and get to a point where we can say years. Because dogs represent a group of individuals as diverse as we are, they are truly a perfect companion in the fight against cancer."

FOCUS ON RESEARCH

Hemangiosarcoma

(cont. from page 3)

The Schlaffers immediately loaded Einstein into the car and took him to their regular veterinarian. After a wait that seemed like an eternity, the veterinarian gave them the news: Einstein had a hemangiosarcoma in his heart. Upon the veterinarian's suggestion, the blood that had built up in Einstein's pericardium was drained. Einstein showed marked improvement after this procedure was completed. "Einstein was up, giving kisses to us and all the vet techs, and generally looking like his old self," said Ms. Schlaffer. After several hours, Einstein's pericardium had not filled back up with blood. The veterinarian scheduled an appointment for Einstein with a cardiologist the next day, and he also recommended making the next 16 hours count.

At the cardiologist's office the next morning, the Schlaffers learned that Einstein's pericardium was full of blood again. The cardiologist explained the surgical options. The average life expectancy post-op was 12 days, with the best-case scenario being an additional two months. "We asked if Einstein was in pain, and the cardiologist indicated he was," said Ms. Schlaffer. "We knew then that we couldn't put Einstein through surgery so we made the difficult decision to let him go."

ADVOCACY

To further their commitment to Leonbergers and canine health, Ms. Schlaffer joined the Board of Directors of the Leonberger Health Foundation. The Leonberger Health Foundation has supported the AKC Canine Health Foundation for many years, contributing to grants for oncology research, including those that specifically study hemangiosarcoma. "I am carrying on Einstein's fight," said Ms. Schlaffer, "and the fight for all dogs that have succumbed to hemangiosarcoma, and the other devastating diseases that take our beloved canine companions from us."

References: PetWave http://www.petwave.com/Dogs/Dog-Health-Center/Heart-and-Blood-Disorders/Hemangiosarcoma.aspx

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