

AMERICAN KENNEL CLUB CANINE HEALTH FOUNDATION PREVENT TREAT & CUBE®

# DISCOVERIES

## issue 50 · fall 2014



# Thank You for Supporting CHF

Thanks to you, veterinary medicine is moving forward and we are working to better understand the greatest health concerns in our dogs. Your support and commitment to the AKC Canine Health Foundation (CHF) has resulted in these measurable impacts:

- Funding for researchers who are mapping the genetic risk factors of hip dysplasia.
- Funding more than \$1 million in hemangiosarcoma research that will identify genetic risk factors for disease and develop novel diagnostic and prognostic tools to increase survival and quality of life.
- Funding four studies totaling more than \$400,000 to identify the genetic cause of inflammatory bowel disease and the underlying mechanisms of disease pathogenesis.
- Funding three innovative grants to address infertility and pyometra.
- Funding of two epilepsy research grants that will identify the cause of the disease and put new drugs into the pipeline for treatment.
- Funding of two grants that aim to better understand the cause and risk factors associated with bloat in dogs.

In 2015, CHF will celebrate our 20th Anniversary, a milestone that would not be possible without you. With your continued support, CHF-funded researchers will work to discover new treatments, technologies and therapies that will benefit not only the dogs we love today, but those we will love in the future.

To learn more about making a donation to help all dogs live longer, healthier lives, please visit **http://support.caninehealthfoundation.org/caninehealth.** And remember, during 2014, your donation may be eligible for the AKC New Donor Matching Challenge. Gifts from new or lapsed\* individuals or clubs are eligible to be matched, dollar-for-dollar, up to \$500,000. Help us spread the word about this great opportunity!

\*last donation on or before 12/31/2011

#### 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.

#### THIS ISSUE AT A GLANCE

CHF Announces Susan Lilly as New CEO2
Champion of Canine Health 2
Celebrating Senior Dog Adoptions
Impact of Your Giving 5

New Grants...... 6

# Join us for the 2014 Canines & Cocktails celebration!

(See back for details.)

## CHF Announces Susan Lilly as New CEO

Susan M. Lilly, Certified Fund Raising Executive (CFRE), has been appointed CEO of the AKC Canine Health Foundation (CHF). Founded in 1995, CHF is the leading organization devoted solely to canine health research, having funded more than \$40 million in worthy scientific research and education to help dogs and their owners live longer, healthier lives.



Ms. Lilly will oversee CHF operations at its headquarters in Raleigh, NC, supervising day-to-day activities, grant administration, financial management and development. She succeeds Dr. Terry T. Warren, PhD, JD, who retired in June after six years in the position.

A native of Michigan, Ms. Lilly boasts a strong fundraising background. After holding development positions at Central Michigan University, she served as director of development at Michigan State University, and, most recently, was executive director of the North Carolina State University Veterinary Medical Foundation.

In announcing Ms. Lilly's appointment, Dr. A. Duane Butherus, CHF board chairman said, "She has proven herself to be an extremely productive fundraiser, able to connect the scientific community with pet-loving donors and to create an outstanding environment of philanthropy. CHF welcomes her expertise and enthusiastic approach as we strive to continue to enhance our outstanding programs."

As Ms. Lilly noted, "CHF has already instituted a valuable, international program of support for canine health. I look forward to building on this history and growing initiatives to further our exceptional mission. When we help our pets, we also enrich our own lives."

# Champion of Canine Health: The Fiesta Cluster Dog Show

In 2008, the board of the Fiesta Cluster Dog Show in Scottsdale, AZ, launched the AKC CHF Fiesta!, a fundraising and public awareness event to benefit the AKC Canine Health Foundation (CHF). Since its inception, the Fiesta! has raised more than \$23,500 to help all dogs live longer, healthier lives. According to Mimi Tysseling, event chairperson, "When the idea of an event to benefit CHF was first brought to the Fiesta Cluster board, the focus was to increase awareness." Originally begun as a sit-down dinner on Saturday night of the cluster, the Fiesta! featured mariachis, a live and silent auction, and a raffle. "When the recession set in, we adjusted the event in order to maintain participation and continue our commitment to CHF," said Tysseling. Most recently, the Fiesta! has hosted a Mexican food luncheon during group time and featured a raffle and silent auction. Over the years, the Fiesta! has been embraced by the show's exhibitors through their donations and supported by the many vendors

supported by the many vendors who supply prizes.

Bobbi Davis, a long-time vendor who donates product for the Fiesta! raffle, became involved through her breed, Sealyham Terriers. According to Davis, many years ago, the breed had health issues with their eyes.



"Sealy owners chipped in to support research to help our dogs, and in doing so, other breeds benefited from the research," said Davis. "Being involved in the Fiesta! and with the Fiesta Cluster Dog Show is an opportunity to be with a group of people who give of their time, money and talent. It's a way for us to give back not only to the industry, but to CHF as well."

Dave and Pam Peat became involved with the Fiesta! after moving to Arizona. "Our interest in CHF goes back to our good friend and early CHF supporter, Bob Kelly, who served on the board for both the AKC and for CHF," said Peat. "Once we moved to Arizona, we felt our participation in the Fiesta! would be an appropriate way to support a deserving cause and honor the memory of Bob."

"We are grateful to the Fiesta Cluster Dog Show for their commitment to CHF," said Dr. A. Duane Butherus, CHF board chairman. "It is through the dedication of individuals and dog clubs that makes advances in canine health possible."

Established by members of the Scottsdale Dog Fanciers Association and Superstition Kennel Club, the Fiesta Cluster Dog Show is held at Westworld in Scottsdale, AZ. This five-day dog show extravaganza includes four all-breed shows, a day of specialty shows, and a terrier group show. It also features three days of agility competitions, an obedience trial and it hosts more than 50 vendors. The Fiesta Cluster is the largest group of shows in Arizona and one of the top 10 in the United States based upon length of time in one location and number of dogs. To learn more about the Fiesta Cluster Dog Show and their Fiesta! event, visit www. fiestacluster.com.

# **Celebrating Senior Dog Adoptions**

"Age is a privilege," says Susie's Senior Dogs' Facebook page.

Since launching in January 2014, the page promoting the adoption of senior dogs from shelters, begun by New Yorker Erin O'Sullivan, has earned more than 190,000 likes. In just two days, the first dog featured, a 13-yearold named "Nina," was adopted. "Bullet McCoy," a 10-year-old retired Greyhound, and "Bear Bear," a seven year-old Pomeranian mix, are among nearly 50 dogs that have found loving homes since then.

The Facebook page celebrating senior dogs is named for "Susie," a 13-year-old mixed-breed Chihuahua with a wiry Mohawk, adopted by O'Sullivan's boyfriend, Brandon Stanton, a photographer and creator of the popular Humans of New York (HONY) Facebook page and book. O'Sullivan, who has a full-time job, surfs the Internet in the evenings to find adoptable dogs at risk of being put down due to shelter overcrowding. After contacting shelter employees to learn about the dogs, she writes Facebook posts to woo the attention of families who might give them new homes.

The page went viral after Stanton wrote a post about it on his HONY page, which has more than 9 million followers. Although Stanton had never owned a dog, he adopted Susie at age 11. Her owner offered her to him after Stanton snapped her picture sitting on a stoop on a Brooklyn street and posted it on Facebook, noting she was the "coolest dog he had ever seen."

"The idea for Susie's Senior Dogs came from the happy, silly bond between Brandon and Susie, and thinking how hard it is for older dogs to find homes," explains O'Sullivan. "When most people think about getting a dog, they think about a cute puppy. But if you bring up the idea of an older dog and touch their hearts, they think, 'Oh.' Sometimes it's just a matter of putting that option in front of them."

Overcrowded shelters are a reality across the country. Aging dogs make up a good portion of those needing homes. They are displaced due to aging owners who cannot care for them or owners who don't understand the changing behavioral and health needs of an older dog or simply want a younger, more playful dog.

Twenty-five percent of shelter dogs are purebreds like "Sassy," a 10-year-old Golden Retriever, whose second owner turned her into the SPCA (Society for the Prevention of Cruelty to Animals) in Cortland, New York, because of her grandchildren's allergies. Carol Allen, president of Golden Retriever Rescue of Central New York, recalls arriving at the shelter and finding "a stressed, vocal, apparently well-bred Golden."

Besides being 25 pounds overweight, Sassy had a yeast infection in her thick coat that took more than a year to treat with frequent medicated baths and oral medications. Allen, who fostered Sassy and then adopted her, was surprised to find the dog's sales contract and photos of the sire and dam in the shelter paperwork.

Allen put a CGC (Canine Good Citizen) title on Sassy and completed her basic obedience training. Sassy's loving, sweet personality quickly came out, making her a natural attraction to any puppies that Allen fostered. Tracking Sassy's breeder from the information, Allen learned that the breeder had been looking for the dog for many years. A co-ownership sales contract with show and breeding rights went by the wayside when the original owner died shortly after buying Sassy.

Overwhelmed with joy to learn that Sassy was safe, the breeder paid for her veterinary care and helped Allen

get a new registration certified so Sassy could be entered in dog shows. At age 13, Sassy competed in her first dog show, the 2009 Yankee Golden Retriever Club Specialty, taking second in the Veteran Sweepstakes and Veterans 12+ classes.

Sassy wiggled her way into Allen's heart. In January 2010, just shy of her 14th birthday. Sassy

2010, just shy of her 14th birthday, Sassy unexpectedly passed away. "No amount of time would have been long enough with this very special Golden Retriever," says Allen.

Beautiful, intelligent and friendly, the Golden Retriever is a versatile companion and hunting dog, as well as the third most popular breed in the country, based on American Kennel Club (AKC) registrations. Likewise, a high number of Goldens are placed in shelters each year: 12,140 Goldens were rescued in 2008, and 8,439 in 2013.

"About 12 percent of rescued Goldens are dogs age 9 and over," says Allen, chair of the Golden Retriever Club

Story continued on page 4



#### **Celebrating Senior Dog Adoptions** (continued)

of America's National Rescue Committee, which supports 98 local independent breed rescues. Collectively, these organizations have about 9,000 volunteers. Allen herself has adopted 20 rescued Golden Retrievers over the years.

Co-founder of the largest foster-based rescue organization in St. Louis, Ellen Ellick realized the need for helping to give senior dogs a second chance through her work as public information officer for the St. Louis Health Department. In 2002, Ellick and her sister, Norma Glodas, began the St. Louis Senior Dog Project with a focus on finding homes for dogs five years of age and older. St. Louis Senior Dog Project has from 50 to 60 dogs in foster care at a time and adopts out about 400 dogs of all ages annually.

"I saw baby boomers aging and figured there was a growing population out there who might actually prefer older dogs," says Ellick. "As for adopters, I found that many young people liked older dogs, too. Sometimes, they just want to do a good thing.

"I often tell people it's unfair to overlook a dog just because you won't have as many years with it. Those years might be wonderful, the best ever. The best part of this work is seeing all the second chances and lives turn around. I love hearing stories of how special a dog was to someone."

About six years ago, Ellick began a blog highlighting successful adoption stories and dogs needing homes, most of whom she describes as being "just about perfect."

Recently, she reflected on accomplishments. "Things are changing for the better," she wrote. "There are fewer commercial puppy mill breeders, the euthanasia rate in shelters has dropped dramatically in the past five years, and low-cost spay-neuter programs have begun to move out of the urban areas into rural areas."

Like Ellick, Allen and Stanton, most adopters of senior dogs share heartwarming stories of these animals' deep love and companionship. Older dogs are so grateful for being given a second chance. Their unconditional love is indeed a celebration of life.

Learn more about our "Old Dogs Rule" campaign and how you can support our Senior Dog Health & Wellness program area at www.akcchf.org/olddogsrule. \*

#### SAVE THE DATE!

The National Parent Club Canine Health Conference, sponsored by Nestlé Purina PetCare, will be held August 7–9, 2015.

Join us in St. Louis, MO, as we hear from leaders in the fields of bloat, epilepsy, oncology, reproduction, nutrition and cardiology. Look for a detailed list of speakers and topics in the next newsletter.



#### **BENEFITS OF ADOPTING OLDER DOGS**

- Usually housetrained, older dogs are less likely to chew shoes and furniture and most already know to use the bathroom outside.
- Adult dogs generally are more trainable than puppies.
- Unlike puppies that are still growing and maturing, senior dogs have reached their adult size and shape so there are no surprises as they grow older.
- Older dogs usually do not demand time and attention like puppies and younger dogs.
- Senior dogs are grateful for a second chance, and once they settle into a new home, they are very likely to become a loving, lifetime companion.

Though you may have less time in life with an older dog than a puppy, there's nothing more rewarding than earning the love of an older animal.

# The Impact of Your Giving

Thanks to you, CHF is funding cutting-edge research that impacts both veterinary and human medicine. In the following grant updates, learn more about how your donations are helping to move medicine forward.

**Grant 1912: Enhancing the Safety and Efficacy of Anti-Cancer Drugs in Dogs** The anti-cancer drugs doxorubicin and daunorubicin are used to treat a wide variety of cancers in dogs and humans. The clinical utilization of these drugs is hampered by the development of cardiotoxicity in about 70% of canine patients.

In early 2013, CHF awarded an Acorn grant to Dr. Javier Blanco, PhD, at the Research Foundation of the State University of New York to study the safety and efficacy of anti-cancer drugs in dogs.

Dr. Blanco focused his investigation on a potential causative agent behind drug-related cardiotoxicity: the enzyme carbonyl reductase 1 (CBR1). Enzymes are critical in cellular and tissue function because they catalyze biological reactions that cause functional changes in cellular activity. Dr. Blanco's research group performed a detailed kinetic characterization of canine CBR1 to determine whether this enzyme causes the production of cardiotoxic products when it acts on the commonly used anticancer drug daunorubicin.

Dr. Blanco and his research group were successful. They found that CBR1 did indeed metabolize daunorubicin. Reduction of daunorubicin by canine CBR1 yields alcohol metabolites (e.g., daunorubicinol) that are devoid of significant anticancer activity. In essence, CBR1 deactivates daunorubicin's antitumor activity and potentially impacts the efficacy of this and other drugs with similar activity (collectively known as anthracyclines) during cancer treatment. Second, his research supports the growing concern of other scientists that intracardiac synthesis of anthracycline alcohol metabolites is key to the serious and dose-limiting cardiotoxicity experienced by some patients during cancer chemotherapy with daunorubicin and other anthracyclines.

In a companion study, Dr. Blanco identified genetic variants in the CBR gene in pediatric cancer survivors (performed in collaboration with the Children's Oncology Group). He and his collaborators identified a CBR variant that is associated with the risk of anthracycline-related cardiotoxicity in survivors of pediatric cancers. In line, novel results derived from the Acorn project identified a genetic variant in canine CBR1 that results in an enzyme (i.e., CBR1 D216) that synthesizes more cardiotoxic alcohol metabolites per unit of time (i.e., faster) than the "wild type" CBR1 V216 variant. Dr. Blanco speculates that canine cancer patients with the CBR1 D216 variant would be at higher risk for cardiotoxicity in comparison to dogs with the "wild type" variant. Dr. Blanco believes that future studies are warranted to determine the impact of CBR1 genotype status on the risk of cardiotoxicity in dogs undergoing chemotherapy with daunorubicin and other anthracyclines.

**Impact of Grant 1912:** This high-impact Acorn grant has helped veterinary oncologists understand the potential underlying mechanism of anthracycline degradation that limits the effectiveness of these drugs in chemotherapy. Future translational work is warranted to determine whether canine CBR1 variants modify the risk of cardiotoxicity in dogs that are undergoing chemotherapy with anthracyclines. Results from this and subsequent studies will usher in a new era of personalized medicine and pharmacogenetics in the dog.

Grant 2083: Stemming the Growing Epidemic of Drug-**Resistant Bacteria** Staphylococcus pseudintermedius is the most common species of bacteria found on dogs. This bacteria is usually a commensal bacteria, residing on skin without causing any problems. However, Staphylococcus pseudintermedius can act as an opportunistic pathogen in some dogs, causing a skin infection (pyoderma) or surgical site infection. In some cases, dogs develop methicillinresistant Staphylococcus pseudintermedius (MRSP) infection, which means that the more common antibiotics will not clear the bacteria. The pathogenicity and antibiotic resistance of MRSP may lie in their ability to produce "biofilm," a phenomena where bacteria are embedded within a self-produced "slime" matrix that allows them to adhere to one another and the skin. Being encased in a biofilm matrix protects bacteria from the patients' immune system and the effect of antimicrobial drugs. Aggressive biofilm production has been hypothesized as one of the reasons for the dramatic and widespread emergence of MRSP internationally.

Biofilm production by bacteria is thought to be regulated by the expression of specific virulence genes. Drs. Ameet Singh and J. Scott Weese reasoned that understanding MRSP biofilm formation at the molecular level will allow for further understanding of this biological process and provide opportunities for identification of novel anti-bacterial targets. Using quantitative real-time PCR (qPCR), these investigators developed and validated an assay that is able to detect significant expression changes in a biofilmassociated gene icaA.

**Impact of Grant 2083:** Development and validation of a quantitative test for biofilm production provides a critical foundation for virulence gene expression studies and may ultimately lead to development of new antibiotics that target biofilm production in this increasingly important veterinary pathogen.

Story continued on page 6

# The Impact of Your Giving

(continued)

# Grants 0137 and 0947: Heritable and Sporadic Genetic Lesions in Canine Osteosarcoma

MicroRNA (miRNA) are small non-coding ribonucleic acids (RNAs), 20-25 nucleotides in length, that act as molecular switches of gene expression and are thought to regulate complex cellular signaling circuits during normal development and disease states. Deregulation of miRNAs has been observed in many types of human tumors including osteosarcoma. The role of miRNAs may differ depending upon their levels of expression. Some miRNAs may have cancer-inducing potential while others may act as tumor suppressors that prevent uncontrolled cellular proliferation. Drs. Subbaya Subramanian and Jaime Modiano of the University of Minnesota College of Veterinary Medicine hypothesized that molecular pathways regulated by differentially expressed miRNAs may contribute to the diverse tumor behaviors observed in canine cancer. If this were the case, they reasoned that tumor-associated miRNA expression may function as informative biomarkers, helping clinicians better evaluate the metastatic potential of osteosarcoma and ultimately, these miRNAs could serve as definitive prognostic indicators. Using a One Medicine approach, these researchers acquired human and canine osteosarcoma patient samples and took a comparative genomics approach to evaluate miRNA expression in osteosarcoma. Drs. Subramanian and Modiano found an inverse relationship exists between aggressive tumor behavior (increased metastatic potential and accelerated time to death) and expression of miRNAs located on the chromosomal locus 14q32. Larger decreases in 14q32 miRNA expression levels are associated with an increased likelihood of metastases and poor outcomes in osteosarcoma patients.

**Impact of Grants 0137 and 0947:** Downregulation of 14q32 miRNA expression is an evolutionarily conserved mechanism that contributes to the biological behavior of osteosarcoma, and quantification of miRNAs associated with locus 14q32, such as miR-382, miR-134 and miR-544, will provide prognostic and predictive markers that can assist in the management of patients with this disease.

**Future Outcomes:** miRNAs could become a novel target for cancer therapy. Recently, the regulation of miRNAs by natural, nontoxic chemopreventive agents such as curcumin, resveratrol and isoflavones has been described. Theoretically, modulation of miRNA expression could inhibit cancer progression, increase drug sensitivity and prevent metastasis, providing a newer therapeutic approach for cancer treatment, especially when combined with conventional therapeutics.

#### AMAZON SMILE!



Are you an Amazon customer? Did you know that for every eligible purchase you make on Amazon using this link—<u>https://smile.amazon.</u> <u>com/ch/13-3813813</u>—Amazon will donate 0.5% of the price to CHF? This is a great opportunity to support CHF while shopping for the holidays!

# **New Grants**

New research grants are detailed here. For more information about any of these studies, including ways to provide financial support/sponsorship, visit www.akcchf.org.

#### **Epilepsy Research Program Area**

CHF is excited to announce the funding of two landmark grants that promise to introduce new and novel approaches to diagnosis, treatment and ultimately, prevention of canine epilepsy. Dr. Sam Long and colleagues will use advanced imaging and ultimately neurostimulation to treat refractory epilepsy and define the neural pathways that are responsible for seizures. Dr. Ned Patterson, along with colleagues with expertise in pharmacology, engineering and human epilepsy from the Mayo Clinic, will investigate the genetic predisposition to disease, determine whether microRNA can be used as a prognostic or diagnostic tool, and ultimately introduce new drugs into the pipeline for the treatment of canine epilepsy. Significant club sponsorship allowed CHF to move these grants from proposals on paper to reality in the laboratory and veterinary clinics. Your continued support of this initiative will keep the pipeline open for this exciting work.

02131: Neurostimulation: A Groundbreaking New Treatment for Canine Epilepsy Principal Investigator: Dr. Sam Nicholas Long, PhD; The University of Melbourne Total Grant Amount: \$116,000 Grant Period: 10/1/2014 - 9/30/2016

**Project Abstract:** Epilepsy is a debilitating condition that affects a large number of dogs, resulting in premature death and distress for their owners. For many dogs, the underlying cause is unknown. In people, advances in some types of imaging have identified subtle abnormalities, including abnormal development and shrinkage of particular regions in the brain of some people with epilepsy that can be surgically removed to improve the control of seizures. This project will apply the same advanced techniques to the brains of dogs with epilepsy to determine whether those same abnormalities can be found, this project will investigate a new form of treatment, known as neurostimulation, which has been shown to dramatically

reduce the frequency of seizures in human clinical trials. This involves surgically implanting a new, highly sophisticated device called the Brain Radio that can provide controlled electrical stimulation to parts of the brain while simultaneously recording the brain's activity. This device is one of the very first that could potentially provide successful therapy only when needed to treat imminent seizures, and if it proves successful in dogs it, could support clinical trials in people with epilepsy.

**02133:** Canine Epilepsy: Genetic Variants, Biomarkers and New Therapies

Principal Investigator: Dr. Ned E. Patterson, DVM, PhD; University of Minnesota Total Grant Amount: \$104,781 Grant Period: 10/1/2014 - 9/30/2015

**Project Abstract:** Epilepsy is a significant seizure disorder affecting all dog breeds. It is the most common chronic nervous system disorder in dogs, with a prevalence of 0.5% - 5.7%, resulting in approximately 2 million affected dogs in the USA. Dr. Patterson has assembled a trans-disciplinary team to attempt to improve the fate of dogs that have epilepsy with a special emphasis on dogs with drugresistant epilepsy. Dogs with drug-resistant epilepsy have frequent seizures even when on two or more anti-epileptic drugs. The team includes veterinarians, canine geneticists, pharmacologists, human neurologists, basic scientists and biomedical engineers from the University of Minnesota College of Veterinary Medicine, College of Pharmacy; Institute for Engineering in Medicine and departments of Neurology and Surgery; and Mayo Clinic in Rochester, MN. Under the guidance of Dr. Patterson, the collaborative group proposes to evaluate traditional DNA genetic markers, blood biomarkers called microRNAs (miRNAs) and potential new drugs for the emergency treatment of seizures in dogs. In phase 1 of Dr. Patterson's study, he and his team will: 1) Identify genetic markers associated with epilepsy in Australian Shepherds and Vizslas, and identify markers



associated with epileptic dogs that are unresponsive to anti-epileptic drug therapy in order to develop genetic screening tests in phase 2, 2) Document microRNA levels in the blood of dogs with epilepsy in order to develop potential blood markers that vary between epileptic and non-epileptic dogs and dogs with drug-resistant epilepsy, and 3) Perform initial testing of two new potential drugs for the emergency treatment of canine epilepsy.

#### Musculoskeletal Conditions & Disease Research Program Area

**02109:** Studying Hypertrophic Osteodystrophy (HOD) in Irish Setter Dogs

Principal Investigator: Dr. Danika L. Bannasch, DVM, PhD; University of California, Davis

#### Story continued on page 8

## Kudos – Fall 2014

Thank you, **Mr. Thomas Nagylaki**, for your generous support helping all dogs live longer, healthier lives!

We salute the **Labrador Retriever Club** for their \$25,000 match eligible contribution.

CHF is excited to be working with the **Weimaraner Club** of America! They have funded \$23,020.97 in research to study hypertrophic osteodystrophy (HOD) in Weimaraners.

Kudos to **Ms. Shelley B. Edwards** for your contributions for canine health research!

Hats off to the **Collie Health Foundation** for becoming a Champion Sponsor for our Epilepsy Initiative!

Great work from **The Keeshond Club of America** for raising \$15,000 of AKC-match-eligible contributions for their DAF to support their breed.

Our sincerest gratitude to the **Kenneth A. Scott Charitable Trust** for their generous support for our *Health–E Barks* Podcast Series and Grant 2085–A: Reducing Animal Shelter Surrender by Enhancing the Human–Animal Bond.

Thank you to **The Saint Bernard Club of America Charitable Foundation** for their \$10,000 contribution for the Epilepsy Initiative.

We are thrilled for support from **Ms. Donna Beadle** for her sponsorship in our upcoming 2015 Champions for Canine Health Calendar. We are honored to feature her Berger Picard in July when the breed will receive full AKC recognition for the herding group.

Thanks to the **Westie Foundation of America** for donating \$15,000 toward research in our Dermatology & Allergy Program Area.

## New Club Members (as of 9/10/14)

The Northern New Jersey Great Dane Club

Total Grant Amount: \$65,340 Memorandum of Understanding grant with the Irish Setter Club of America Foundation Grant Period: 8/1/2014 - 7/31/2015

**Project Abstract:** Hypertrophic Osteodystrophy (HOD) is a canine developmental disease that affects dogs between eight weeks and eight months of age. Sick dogs exhibit swelling and pain in their legs with reluctance to stand or walk. In addition to bone pain, there are variable general signs, including fever, lethargy, depression and loss of appetite. The prognosis for severe cases is poor due to relapsing episodes and the low quality of life for the affected puppies, which often results in euthanasia. HOD has a strong familial component and is reported among closely related individuals in the Irish Setter breed as well



as other large breeds such as the Weimaraner, Great Dane, German Shepherd Dog, German Shorthaired Pointer, Labrador Retriever, Great Pyrenees and Boxer. Although the exact cause of HOD is unknown, frequent occurrences within an inbred population of dogs suggests an inherited component plays a role in HOD. A similar disease in children is called chronic recurrent multifocal osteomyelitis (CRMO). Affected children between the ages of five and 18 vears suffer from recurrent episodes of unexplained debilitating bone pain

that prevents them from experiencing a normal childhood. The aims of this study are to better describe the immune component, and to identify the genetic basis of HOD in Irish Setter dogs. This will allow breeders to reduce the number of HOD-affected puppies and perhaps save puppies and owners from the devastating outcome of euthanasia. Results from this study have the potential to assist other breeds with HOD and children with CRMO.

**02120:** Investigating Hypertrophic Osteodystrophy in Weimaraner Dogs

Principal Investigator: Dr. Danika L. Bannasch, DVM, PhD; University of California, Davis

#### Total Grant Amount: \$26,460

Memorandum of Understanding grant with the Weimaraner Club of America

Grant Period: 8/1/2014 - 7/31/2015

**Project Abstract:** Hypertrophic Osteodystrophy (HOD) is a developmental autoinflammatory disease affecting young, rapidly growing dogs. Affected dogs exhibit clinical signs of fever, anorexia, lethargy and lameness. A similar disease called chronic recurrent multifocal osteomyelitis (CRMO) is seen in children. The cause for HOD remains unknown, but since specific breeds are predisposed, an inherited etiology is probable. The Weimaraner breed is susceptible to HOD, and closely related dogs such as full-siblings can be affected. Additional predisposed breeds are the Irish Setter, Great Dane, German Shepherd Dog, German Shorthaired Pointer, Labrador Retriever, Great Pyrenees and Boxer. Currently, dog breeders do not have genetic resources available to select against HOD



in their lines. Dr. Bannasch and her team hypothesize that exonic non-synonymous mutations associated with HOD in dogs can be identified by comparing whole-genome sequence reads from HOD cases and controls. She will investigate exonic non-synonymous variants homozygous in Weimaraners with HOD, and will study the immune basis of HOD in the breed by testing serum levels for immune markers. Evaluating candidate causative mutations will enable Dr. Bannasch and her team to recognize etiological pathways, and together with investigating the immune component of HOD, will advance understanding of the disease pathogenesis. This could also lead to the development of a DNA test to allow Weimaraner breeders to minimize the number of HOD cases. Understanding the etiology of HOD could also lead to the development of specific means of prevention and treatment regimens. Advances in prevention and/or treatment of HOD will benefit susceptible dogs, and may aid human patients with autoinflammatory syndromes such as CRMO.

02142-A: Development of Magnetic Resonance Imaging as a Non-Invasive Tool to Accurately Evaluate Elbow Dysplasia Principal Investigator: Dr. Samuel Patrick Franklin, DVM, PhD; University of Georgia Research Foundation, Inc. Total Grant Amount: \$12,398.40 Grant Period: 8/1/2014 - 8/31/2015

**Project Abstract:** Canine elbow dysplasia (CED) is a common problem with numerous different forms of varying nature and severity. Currently, radiographs (X-rays), computed tomography (CT; CAT scan) and arthroscopic surgery are used to make a diagnosis of elbow dysplasia and to characterize the degree of joint damage that a dog has suffered as a result of having CED. Unfortunately, neither radiographs nor CT provide evaluation of the cartilage in the joint. Rather, surgery has to be performed, either standard or arthroscopic, to visualize the cartilage before a thorough appreciation of the joint abnormalities can be obtained. As a result, definitive treatment plans cannot be established until after surgical assessment of the joint is performed. This stands in contrast to human medicine in which magnetic resonance imaging (MRI) can be used to

assess cartilage non-invasively in order to make diagnoses and direct treatments prior to surgery. Theoretically, MRI could similarly be used in veterinary medicine to more thoroughly evaluate cartilage health in the canine elbow, thus enabling determination of a treatment plan before surgery is performed. Likewise, MRI might be used to assess the response to different treatments and progression of disease. Working in collaboration with human radiologists, Dr. Franklin will perform MRI in dogs with elbow dysplasia using novel quantitative MRI protocols to determine whether MRI can be used for complete characterization of the nature and severity of joint damage in dogs with elbow dysplasia. Ultimately, accurate disease phenotyping will facilitate the treatment of patients, the development of novel therapeutics and the prevention of disease through informed breeding programs.

#### **Neurology Research Program Area**

**02139–A:** Development of a Neuromusculoskeletal Computer Simulation Gait Model to Characterize Functional Recovery in Dogs with Intervertebral Disk Herniation

Principal Investigator: Dr. Gina E. Bertocci, PhD; University of Louisville

Total Grant Amount: \$12,740 Grant Period: 9/1/2014 - 8/31/2015

Funding for the research is provided through the efforts and generosity of The Dachshund Club of America.

**Project Abstract:** Intervertebral disk herniation (IVDH) leads to spinal cord injury (SCI) in dogs. The most commonly affected breed is the Dachshund, of which 19% develop IVDH. IVDH compresses the spinal cord and can lead to paralysis, incontinence, reduced quality of life, permanent neurological deficits and secondary conditions. Dogs that receive decompressive surgery (standard of care) and rehabilitation immediately following IVDH may regain the ability to walk. Certain aspects of recovery, such as muscle activation patterns, are not clearly understood and play a pivotal role in whether dogs regain full function of their limbs. Scientists know that neurologic disruption following IVDH alters muscle recruitment strategies leading to compensatory changes in muscle function post-injury. An improved understanding of muscle activation during walking following IVDH-associated SCI is paramount to developing strategies to enable full recovery. The goal of Dr. Bertocci's study is to characterize individual muscle activation patterns during walking. Her research group is responsible for development of landmark computer simulation techniques that have transformed our understanding of cranial cruciate ligament disease. She will now apply this successful methodology to IVDH and assess muscle function in: 1) a healthy Dachshund, 2) a Dachshund with moderate IVDH-associated SCI following surgical decompression at multiple time points during recovery. Proof-of-principle computer models will be developed based on medical imaging, hind-limb motion, ground reaction forces and body weight support during walking. They will characterize differences in hind-limb motion and

muscle activation patterns during walking between the healthy dog and a dog with SCI, as well as differences in the dog with SCI throughout recovery. Their outcomes will enhance understanding of functional recovery following surgical treatment of IVDH, which will provide a foundation for improved clinical decision-making regarding treatment options and investigating future therapeutic interventions.

O2141-A: Describing the Kinetic and Kinematic Recovery of Dachshunds with Spinal Cord Injury Principal Investigator: Dr. Gwendolyn J. Levine, DVM; Texas A&M AgriLife Research Total Grant Amount: \$12,935 Grant Period: 9/1/2014 - 8/31/2015

Funding for the research is provided through the efforts and generosity of The Dachshund Club of America.

**Project Abstract:** Intervertebral disk herniation (IVDH) is common in dogs and results in injury by compressing and bruising the spinal cord. The most frequently affected breed is the Dachshund, with as many as 19% of Dachshunds

developing IVDH. Effects of IVDH include paralysis, paresis, incontinence, reduced quality of life and permanent neurological disabilities; these facets of injury place a tremendous burden on caregivers. Traditionally, qualitative scoring systems have been used to determine injury severity, recovery and to identify if therapies are effective. More recently, computerized gait assessment (kinematics) has been applied to dogs with IVDH. These studies have examined dogs at single time points and suggest that kinematics is more sensitive than traditional scoring in detecting changes in gait. The goal of Dr. Levine's research is to characterize gait



recovery in Dachshunds with IVDH using kinematics. She will utilize dogs with moderate and severe injury to capture the spectrum of dysfunction and recovery that occurs following injury. All dogs will receive spinal decompression surgery (standard) and be assessed at five time points: pre-surgery and seven, 14, 30 and 90 days post-surgery. Information will be compared to the gait of healthy Dachshunds. This work is novel based on the quantitative, kinematic and longitudinal characterization of locomotion in healthy and spinal-cord-injured Dachshunds. The major outcomes will be: 1) an enhanced understanding of natural recovery post-IVDH, 2) improved clinical decision-making with respect to treatment options, 3) identification of effective assessment parameters, and 4) creation of a baseline for future clinical trials assessing therapies.

Story continued on page 10

02143-A: Development of a Novel Treatment for Intervertebral Disc Disease Principal Investigator: Dr. Gordon S. Mitchell; University of Wisconsin, Madison Total Grant Amount: \$11,903 Grant Period: 8/1/2014 - 1/31/2016

**Project Abstract:** The spinal cord transmits information from the brain to muscles that initiate movements, such as breathing and walking. Spinal cord injury disrupts these neural pathways, causing partial or even complete loss of walking ability. In dogs, spinal injury commonly occurs as a consequence of vertebral disc herniation. While some recovery of walking ability occurs through uninjured spinal pathways, the extent of spontaneous recovery is slow and frustratingly limited in most cases. Neural plasticity (i.e., changes in neural pathways and synapses) in the spinal cord increases the strength of these uninjured neural pathways and increases the strength of muscular contractions and walking ability. One recently established method of inducing spinal plasticity involves breathing intermittent periods of slightly lowered oxygen levels to create a non-life-threatening state of hypoxia. Dr. Mitchell's research group recently discovered that this technique increases walking ability in rats and humans with chronic, incomplete spinal injuries, and has an even greater effect when paired with traditional rehabilitation strategies such as walking practice. In a similar way, they believe administration of very modest protocols of intermittent hypoxia will improve walking endurance and speed in dogs with spinal injuries due to intervertebral disc disease. Dr. Mitchell and colleagues intend to investigate the impact of intermittent hypoxia, with and without paired locomotor training as a completely new canine rehabilitation strategy. Intermittent hypoxia has proven to be a very safe and effective means of restoring motor function in other species, and they predict that the same will be true in dogs with chronic injuries - a population with no prognosis for further recovery using any currently available technique.

#### **Oncology Research Program Area**

**02091–A:** Differentiating between Localized and Disseminated Histiocytic Sarcoma in Bernese Mountain Dogs **Principal Investigator:** Dr. Elaine A. Ostrander, PhD; National Human Genome Research Institute **Total Grant Amount:** \$10,300 *Memorandum of Understanding grant* with the Berner Lovers Donor Advised Fund

Grant Period: 8/1/2014 - 7/31/2015

**Project Abstract:** Canine histiocytic sarcoma (HS) is a disease arising chiefly from cells called histiocytes, which play an important role in the immune system. While HS is relatively uncommon among most dog breeds, it is present at high frequency in Bernese Mountain Dogs (BMD) and Flat-Coated Retrievers (FCR), with more moderate incidence reported in Labrador Retrievers and Rottweilers. For BMDs, HS accounts for over 25% of deaths and the average survival time is just 49 days from diagnosis. Commonly, this cancer is

divided into two subtypes: localized, a tumor arising in a single organ or limb and often metastasizing to other organs, and disseminated, multiple tumors arising at the same time (often referred to as malignant histiocytosis). Survival time is nearly five times greater for dogs diagnosed with localized HS compared to disseminated HS. However, no clinical guidelines exist to differentiate between these two subtypes and diagnosing subtypes remains largely clinically subjective. Dr. Ostrander and her team will seek to develop clinical indicators of the differences between localized and disseminated HS. She will do this by comparing gene expression in tumors



and complement this approach by investigating a marker that is crucial for tumor cell immortalization and cancer progression. Together, these experiments will provide them with the first insight into the differences that exist between these two types of HS tumors. Such information will be crucial to aid in the diagnosis and treatment options available to clinicians, providing a powerful step forward in treating this devastating cancer.

**02093–A:** Sequencing Histiocytic Sarcoma (HS) Loci Identified by Genetic Association Studies in the Bernese Mountain Dog (BMD)

Principal Investigator: Dr. Catherine Andre, PhD; CNRS – University of Rennes

Total Grant Amount: \$10,300 Memorandum of Understanding grant with the Berner Lovers Donor Advised Fund Grant Period: 8/1/2014 - 7/31/2015

**Project Abstract:** Histiocytic sarcoma (HS) occurs at a high incidence in few breeds, specifically in Bernese Mountain Dogs (BMD), Rottweilers and retrievers. Dr. Andre and her team have previously identified main genomic regions associated with HS in the BMD breed. The validations of these regions on over 1000 French BMDs allowed them to develop a first genetic "pre-test" to estimate the risk of developing and transmitting HS in BMDs. This pre-test, now available for breeders, is a first tool to progressively reduce the frequency of this cancer in BMDs. While major regions involved in HS are known, involved genes and mutations are still unknown. Breed structure is expected to be powerful to study the genetics of complex traits such as cancers, and to reduce large regions of association. The

analysis of affected Rottweilers allowed Dr. Andre and her team to reduce the main region of CFA11 to 200 Kb and to confirm the involvement of a second region on CFA11. Using this multiple-breed strategy, they analyzed affected Rottweilers and retrievers, and selected three main loci involved in HS predisposition. Sequencing these loci is now mandatory to determine the genetic alterations leading to the susceptibility for HS in BMDs. These experiments will lead them to improve the present genetic testing (pretest), improve diagnosis and test and use more adequate treatments for HS in BMDs.

#### **Ophthalmology Research Program Area**

02146-A: Development of a Novel Drug Delivery System to Prevent Vision Loss in Canine Cataract Patients Principal Investigator: Dr. Heather Chandler, PhD; Ohio State University Total Grant Amount: \$12,960 Grant Period: 9/1/2014 - 8/31/2015

**Project Abstract:** Cataracts are the most common cause of treatable blindness in dogs. Surgery is the only way to restore normal vision, and although every effort is made to remove as much lens material as possible during cataract surgery, it is inevitable that some lens cells are left behind

within the eye. These lens cells will move and multiply, resulting in the most common complication to cataract surgery, posterior capsule opacification (PCO). PCO interferes with light transmission and results in secondary vision loss in 80-100% of canine cataract patients. Unfortunately, there is no consistently effective treatment for PCO. Studies performed in laboratory animals have found that use of a commonly prescribed drug, cyclosporine, can decrease PCO formation. Dr. Chandler believes that cyclosporine may provide a safe, cost-effective and reliable option to prevent PCO. Using a laboratory animal model system, Dr. Chandler will evaluate the effectiveness of a novel gel-based drug delivery polymer to release cyclosporine at the correct dose and time needed to prevent PCO. Post-cataract surgery, eyes will be treated with the delivery device releasing cyclosporine, while other eyes will be treated with the delivery device and no cyclosporine. Dr. Chandler expects that her novel drug delivery gel will be able to release cyclosporine for at least one week at the correct dose to prevent PCO. If successful, future studies will focus on incorporating cyclosporine drug delivery in canine clinical trials, potentially providing ophthalmologists a new method of restoring and maintaining excellent vision in dogs that have been blinded by cataracts. 🖄

#### Top Donor Advised Fund Research Sponsors (6/14/14 - 9/10/14)

Donor Advised Fund	% Move
Weimaraner Club of America	100%
Pug Dog Club of America	99%
Orthopedic Foundation for Animals	95%
Great Dane Club of America	84%
Siberian Husky Club of America, Inc.	68%
Golden Retriever Foundation	62%
Berner Lovers	38%
The Dachshund Club of America	37%
The Boston Terrier Club of America	34%
Tibetan Spaniel Club of America	33%
Greater Swiss Mountain Dog Club of America	30%
English Setter Association of America	25%
Labrador Retriever Club	24%
Alaskan Malamute Club of America	23%
Japanese Chin Club of America	16%
American Cavalier King Charles Spaniel Club Charitable Trust	14%
Chihuahua Club of America	1%





PO Box 900061 Raleigh, NC 27675-9061

#### You can make a difference...Donate Today!

A gift to CHF helps dogs live longer, healthier lives by supporting cutting-edge research to prevent, treat and cure canine disease.

Like us on **1** /AKCcaninehealthfoundation Follow us on **2** @caninehealthfnd Link with us on **in** akc-canine-health-foundation Check us out on **3** /K9HealthFoundation



www.akcchf.org 888.682.9696

Alliances



**KENNEL CLUB<sup>™</sup>** 

**ZOETIS**. ■PURINA.



Benefitting the AKC Canine Health Foundation

Thursday, December 11, 2014 • 6:30 - 9:00 pm

Rosen Centre Hotel - Ballroom D 9840 International Drive • Orlando, FL 32819

Join us as we kick off our 20th Anniversary celebrating the milestones made in canine and human health!

Cocktail reception will include heavy hors d'oeuvres, cash bar, music entertainment, raffle and door prizes.

Tickets are \$75 per person. (*Tax-deductible portion of each ticket is \$50.*) Sponsorship opportunities available.

For more information and to purchase tickets, visit www.akcchf.org/caninesandcocktails or call 888.682.9696.

Please RSVP by December 1, 2014.

