It seems like a long time ago, but it was great to see everyone at the National in Oklahoma City.

Mary Hunter and I enjoyed visiting with shoppers at the ringside CHF Promotions booth and scanning those credit cards through the smart phone PayPal scanner! Thank you to all our shopping supporters. Income totals: Promos $7,200; Day Auction $3,800; Night Auction over $10,000! Think about all the good work we can do!!

Pati Merrill did a terrific job setting up the daily auction tables and coordinating the team of volunteers.

I hope you were there to enjoy the fun at the annual CHF Dinner and Night Auction arranged by Robette Johns and Krista Hansen. Holding the microphone was new auctioneer, David Hansen. Look out Bob Kelly, you’ve got some competition!

On display was a selection of great items ranging from classic prints and original artwork, exquisite Royal Dalton’s and Lladro’s, beautiful jewelry, and handmade quilts to antique trophies and a collie hair coat. Thank you to all our donors!

Hand painted image of Ch Rosebank Lochlaren Keepitasecret at auction with tag team bidders.
Special thanks to all who donated their time for set-up, sales, spotters, models and collection agents: Phyllis Autry, Bill Brokken, Les Canavan, Barbara Cleek, Amy Gau, Erin Gorney (although we chased her and her cold out of there!), Jeffie Greer, Krista Hansen, David Hansen, Rayleen Hendrix, Janet Hitt, Debbie Holland’s Body Double, Maureen, Mary Hunter, Robette Johns, Pat Jung, Gayle Kaye, Laura LaBounty, Nancy McDonald, Heidi Mendez, Pati Merrill, Tammy Rice-Russell, & Ginny White. And, of course, thanks to Toni Bailey and our own CHF money-grabber, Prosper! Please let me know if I’ve missed anyone and please know your help is appreciated.

Although she was unable to join us at the National, I had the pleasure of awarding the 2014 President’s Trophy to Chandra Flaim. This award is presented to an outstanding individual dedicated to aiding CHF reach its goals. Chandra has worked diligently to rebuild the CHF Promotions program and drove all the way from Wyoming to the Springfield National and to the Sunnybank Gathering to sell, sell, sell. She joins a long list of remarkable honorees:

1987 - Dana Rodman
1988 - Collie Club of America
1989 - John Honig
1990 - Cynthia Alvarado
1991 - Helen K. Denton
1992 - Nancy Morales
1993 - Hilda VH. Rickenbaugh
1994 - Helga Kane
1995 - Heidi M. Mendez
1996 - Pati Merrill
1997 - Nancy McDonald
1998 - Gayle Kaye
1999 - Krista Hansen
2000 - Peggy Darington
2001 - Dr. Cindi Bossart
2002 - Steve & Robette Johns
2003 - Lori Montero
2004 - Gerrie Oliver & Sunnybank Gathering Committee
2005 - Laura LaBounty
2006 - Jeanne Marre
2007 - Norman Markese
2008 - Nancy Van Note
2009 - Brenda Walker & Pat Rosenbaum
2010 - Barbara Cleek
2011 - Nancy Kelso, DVM
2012 - Mary Hunter
2013 – Michele Brane
2014 – Chandra Flaim

Chandra Flaim with the President’s Trophy

The Gathering at Sunnybank will celebrate “Puppies, Puppies, Puppies!” on August 15th & 16th. In between the traditional walking tours and match shows there will be a Rescue Parade, Nose Work Demo and lots of fun. Find the flyer inside for all the details.

Lastly, remember the importance of MDR-1 testing and vigilance in discussing drug sensitivities with your vet before administering any new drug. Collie Health Foundation offers a $20 rebate to CHF members through the end of the year! Cost is $70 per test for 1-4 tests performed at Washington State University. See www.vetmed.wsu.edu/depts-VCPL/.
PUPPIES, PUPPIES, PUPPIES!
The 19th Annual Gathering at Sunnybank, 381 Terhune Drive, Wayne, NJ 07470
All Proceeds Benefit the Collie Health Foundation
www.colliehealth.org

SATURDAY
August 15, 2015
SUNNYBANK DAY

Sunnybank Walking Tours
9:00a - Judy Leathers & Donna McKoy
9:30a - Marilyn Horowitz & Kathy George
w/musical entertainment by Susan Chandler

10:00am to 2:00pm - Microchip Clinic - $25
AKC CAR Including lifetime enrollment; no annual fees
24/7 Recovery Support - Collar ID tags

11:00am – Puppies, Puppies, Puppies!
New APT Stamp Project, Marilyn Horowitz
APT’s Proper Puppy Care Advice, Kathryn George
APT’s Puppy Practice, Kristina Marshall
Puppies & Kids, Judy Leathers
A Puppy’s Sunnybank Start, Gerrie Oliver

1:00pm – CGC & CGCA Testing - $15*
Jeffrey Ball, Evaluator
CGC dogs must be 6 months of age
Appointments suggested but walk-ins welcome-first come, first serve

1:00pm - Bright & Beautiful Therapy Dog Testing – $25*
Cindy Mauro, Evaluator
Entries Limited to 15 Dogs – Pre-registration Required
Therapy Dogs must be 1 Year Old & Basic Obedience

*For CGC/CGCA or TDT Registration Call Sue Chandler
973-696-2506 or email greyskyes110@optonline.net

1:00pm – Rescue Parade - $5 - All Welcome!
Advance Registration Strongly Recommended – Form Attached
FMI: Karyn at 201-370-4532 or thehahns@optonline.net
Sponsored by Collie Rescue of Northern New Jersey - Follow Us on Facebook!

NEW EVENT!!!
2:00pm – K9 Nose Work
Melanie Kerber, Kerber Dog Training
Certified Instructor, National Association of Canine Scent Work
Janette Tough with “Piper” & “Paisley”
Let Your Super Snooper Give It A Try!!

6:30p - Banquet Dinner @ Portobello’s
155 Ramapo Valley Road, Oakland
$40 Advance Reservations ONLY (Door $45)
Send Check Payable to “CHF” to Gerrie by 8/8

FMI: Gerrie Oliver, 60 Columbus Avenue, Closter, NJ 07624
(201) 768-1282 - gerrieoliver@hotmail.com

FMI: Nancy McDonald, 2834 Cotten Road, Sanford, NC 27330
(919) 718-9347 - nancy@collieexpressions.com

Collie Expressions and colliesonline.com - Generous Supporters of “CHF”

SUNDAY
August 16, 2015
COLLIE DAY

9:00am – Puppy Selection Program
Nancy McDonald

10:00 am - Virtues Match
* PROFILE *
SKULL*MUZZLE*EXPRESSION*
* OUTLINE * FRONT * REAR * SIDE GAIT *
Moderated by Royal Rock’s Leslie Canavan
Judges:
Sandra Thompson, Kendra
Barbara Cleek, Lochlaren
Larry Parsons, Cheviot
NEW BEST IN VIRTUES TROPHY!
The Gathering Juniors’ Match
Judges: Susan Kaelin, Calibre

Lad of Sunnybank Memorial Match
“Lad of Sunnybank” Trophy Best in Match
Judges:
Dogs: Nancy Parsons, Cheviot
Bitches: Susan Kaelin, Calibre
Virtues Match: $5/Virtue or $12 for 3
Juniors & Lad Match Entry: $5

THERUNE COLLECTION
Visit the Van Riper-Hopper House, 533 Berdan Avenue, Wayne, NJ
973-694-7192 Friday 12pm – 3pm & Saturday 1pm – 5pm

HOTELS
Special Rates – Ask for the
“GATHERING AT SUNNYBANK 2015”
HOLIDAY INN EXPRESS, 303 Union Ave.
Haskell, NJ 07420 - Suites $110
CALL DIRECT 973-839-4405
LA QUINTA INN & SUITES, 1850 Rte. 23 & Ratzer Rd., Wayne, NJ 07470 $89/night
CALL DIRECT 1-973-696-8050
NEW!
Ramada Inn, 334 Rt. 46 East/Service Road, Wayne, NJ 07470 $85/night; $20/one-time pet
Friendly Faces, Breakfast Included, Dog Friendly, Outdoor Pool & Courtyard
“Tilted Kilt” Restaurant Connected!!!
CALL DIRECT 973-256-7000
If you have a rescued purebred rough or smooth collie who is still with us but cannot make it to the parade this year he/she can still be honored by filling out this form and INCLUDING a photograph - the photo can be any size but the larger the better.

Dog’s Name__________________________________________________________

Dog’s Journey: (Please be thorough but brief - This will be your introduction to the parade):
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Your Name: __________________________________________________________________
Phone/e-mail: __________________________________________________________________
Address: ___________________________________________________________________

$5.00 Per Entry - Total: $_______
Check payable to “CHF” before 8/10
All Proceeds to CHF

To: Ms. Karyn Hahn
119 Edward Drive, Ringwood, NJ 07456
FMI: Karyn at 201-370-4532 or thehahns@optonline.net

Sponsored by Collie Rescue of Northern New Jersey - Follow Us on Facebook!
See you at Sunnybank!

THE COLLIE HEALTH FOUNDATION HAS SOME EXCITING NEW ITEMS AVAILABLE THIS YEAR!

- **Car Magnets** with CHF Logo
- **Key Chains** with CHF Logo
- **Silhouette Mail Box Toppers** (Rough and Smooth Collie shapes available)

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TRADITIONAL ITEMS WILL BE AVAILABLE TOO!

- **Polo Shirts**
- **Sweatshirts**
- **Pin Brushes**
AKC GRANTS APPROVED FOR FUNDING

In April 2015, following recommendations from the Grants Committee, the Board of Directors voted to help fund the following AKC grants.

1. **02138: Development of Accurate Diagnostic Tests for Canine Hypothyroidism**  
   Principal Investigator: Dr. Jan A Mol, PhD  
   Institution: University of Utrecht

   Primary hypothyroidism is one of the most common endocrine disorders in dogs. The insufficient secretion of thyroid hormones may result in severe physical and mental changes, such as lethargy, alopecia, obesity, decreased cardiac output, and decreased renal perfusion. The diagnosis of hypothyroidism is sometimes problematic. The circulating thyroxin (T4) concentration is below the reference range in most dogs with primary hypothyroidism, but T4 is not very specific as it can also be low in sick dogs with a normal thyroid function, i.e., dogs with non-thyroidal illness (NTI). However, a combination of a low T4 concentration and a clearly elevated plasma thyroid stimulating hormone (TSH) concentration is a definitive proof of hypothyroidism. Unfortunately, about 30% of dogs with primary hypothyroidism have a TSH concentration within the reference range and therefore cannot be distinguished from dogs with NTI. Consequently, either dogs with NTI are unnecessarily treated with thyroxin supplementation or dogs with primary hypothyroidism may lack proper treatment. Dr. Mol and colleagues propose to investigate 3 methods that may provide a more accurate diagnosis than the currently available tests for practitioners. They will test whether 1) a stimulation test with measurements of plasma growth hormone and TSH concentrations, 2) the plasma TRH or ghrelin concentration, or 3) a reporter assay for plasma thyroid hormone bioactivity, can be used to differentiate between dogs with primary hypothyroidism and dogs with NTI.

2. **02133: Canine Epilepsy: Genetic Variants, Biomarkers, and New Therapies**  
   Principal Investigator: Dr. Ned E. Patterson, DVM PhD  
   Institution: University of Minnesota

   **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. We have assembled a trans-disciplinary team to attempt to improve the fate of dogs that have epilepsy with a special emphasis on dogs with drug-resistant epilepsy. Dog with drug-resistant epilepsy have frequent seizures even when on 2 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. Ned 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.
3. **01822: Beyond the Genome: The Intersection of Genes and the Environment in Canine Cancer**
   Principal Investigator: Dr. Robert K Wayne, PhD
   Institution: University of California, Los Angeles
   
   **Project Abstract:** Not all genes are active at all times. DNA methylation (the addition of methyl groups to DNA) is one of several mechanisms that cells use to control gene expression. Abnormal patterns of DNA methylation have been observed in human cancer. However, methylation remains an unexplored dimension of canine disease. This seed grant to Dr. Wayne will allow him to establish the techniques and methodologies necessary to define the pattern of normal variation in methylomes (the genome-wide collection of methylated sites) from an array-based analysis of a variety of domestic dog breeds. Differences in methylation found between breed lineages will be complemented by the study of gene expression to understand how methylation regulates levels of expression. Upon completion of this study, Dr. Wayne's laboratory will have proof-of-principle for evaluation of the canine methylome. Ultimately, he intends to establish a public web-based resource to serve as a repository for the dog methylomes. The collection of methylomes they generate will contribute to the growing resources that are available for investigation of disease etiology as well as advancing therapeutic approaches. These data will provide a new resource for understanding how gene regulation through methylation affects phenotype, disease and overall canine health.

4. **01849: Filling the Gaps in the Canine Genome**
   Principal Investigator: Dr. Shaying Zhao, PhD
   Institution: University of Georgia Research Foundation, Inc
   
   **Project Abstract:** The sequencing of the genome of man's best friend in 2005 has provided an invaluable resource to the canine research community, and has reinforced the position of the dog as an important model organism to study human physiology and disease. Unlike the human and the rodent models (the mouse and the rat), very few dog genes had been sequenced prior to its whole genome sequencing. Consequently, the dog genome has been annotated for its gene content primarily based on mapping the gene-related sequences from the human, the mouse, the rat, and other non-dog species to the dog genome. While providing the research community with an unprecedentedly large set of dog genes, the definition of DNA sequences as coding sequences (i.e. gene annotation) has substantial errors and is missing in dog-specific information in many aspects. This significantly hinders research in many fields such as disease gene discovery and cancer-causative gene mutation identification, where functional information about a gene is required to make progress. Dr. Zhao will use state of the art next-generation sequencing strategies to identify genes/transcripts expressed in major dog tissues and cell types. The valuable data, along with more refined sequence alignment between the dog and other species, will be used to build the most accurate and complete annotation of the dog genome for its gene annotation. The project will significantly facilitate research in areas of canine health most significant to the AKC Canine Health Foundation constituency and lead to important RNA-based (transcriptomic) and protein-based (proteomic) research in the future.

5. **01840: Health Implications of Early Spay/Neuter on Canine Health**
   Principal Investigator: Dr. Benjamin L Hart, DVM, PhD;
   Institution: University of California, Davis
   
   **Project Abstract:** Most dogs in the United States are spayed or neutered, and the default recommendation has been to perform these elective surgeries prior to physical maturity. However, recent data suggest that early spay and neuter may adversely impact the health and well-being of dogs. In preliminary studies funded by CHF, Dr. Ben Hart of the UC Davis College of Veterinary Medicine found that early spay or neuter, prior to 12 months of age, was related to a significant increase in risk in five diseases of concern: hip dysplasia; cranial cruciate ligament tear; lymphosarcoma; hemangiosarcoma; and mast cell tumor.
CHF has now funded the second phase of Dr. Hart's research in which he will expand his work to consider breed differences in vulnerability to joint disorders and risks of various cancers after early or late spay/neuter. Breeds considered will include: Labrador Retrievers, German Shepherd Dogs, and Dachshunds. Rottweilers, Chihuahuas, Standard Poodles, and Miniature Poodles will be included if resources and patient data are available. The expectation is that by inclusion of multiple breeds in phase II Dr. Hart will be able to develop a generalized understanding of the impact of early spay and neuter on disease risk in dogs. This in turn will enable veterinarians and breeders to make data-driven recommendations regarding timing of spay/neuter procedures to reduce the risk of development of multiple devastating diseases.

6. **02118-A: Targeting the Mechanism of Bacterial Adherence during Pyometra to Develop an Effective, Non-Invasive Treatment for Disease**

   **Principal Investigator:** Dr. Cordula Bartel, PhD;  
   **Institution:** University of Veterinary Medicine of Vienna

**Project Abstract:** Pyometra is the most common uterine disease in intact bitches leading to potentially life-threatening complications due to the systemic inflammation that occurs as a result of infection. We know that E. coli bacteria are the most abundant infectious agents associated with pyometra in bitches, but how and why these bacteria are able to colonize the endometrium and cause disease is unclear. In a previous study Dr. Bartel’s research group characterized a unique epithelial cell type known as “foam cells” on the canine endometrial surface. Foam cells occur most often during diestrus (also called metestrus), the cyclic stage most commonly associated with the occurrence of pyometra. Foam cell formation appears to be part of the normal physiological process of preparation of an embryo for implantation. From other species we know that the foamy appearance of the epithelial cells is caused by lipid droplet accumulation and that the uptake of lipids from the blood is accomplished via special lipid receptors on these cells known as SR-B1. Interestingly, SR-B1 is a strong binding partner for bacteria and Dr. Bartel’s lab hypothesizes that this receptor is a major contributor to the development of pyometra. They also believe selective blocking of this receptor will lead to a reduction of clinical signs of inflammation and decreased convalescence-time and tissue damage during pyometra. The first step to testing this hypothesis is to detect SR-B1 in the canine endometrial epithelial cells and to elucidate its role in lipid accumulation in endometrial epithelial cells during pyometra development. In this pilot project these researchers will evaluate SR-B1 mRNA and protein in the canine endometrium with the goal of ultimately establishing a new, non-invasive pyometra treatment that impairs bacterial adhesion to the endometrial wall.

7. **02107: Landmark Clinical Trial to Establish the Evidence-Based Use of Regenerative Medicine to Treat Tendon Injury in Dogs**

   **Principal Investigator:** Dr. Jennifer G. Barrett, DVM, PhD  
   **Institution:** Virginia-Maryland Regional College of Veterinary Medicine

**Project Abstract:** Regenerative medicine is a rapidly developing field with the potential to transform the treatment of canine disease. The ability to repair damaged tissue and treat diseases once believed to be incurable may soon be a reality. However, there are concerns that some techniques are being used prematurely. Due to the lower regulatory barriers in veterinary medicine, company-sponsored regenerative medicine products and techniques are currently used in general practice and specialty hospitals without the benefit of having been preceded by stringently controlled, independently funded clinical trials. As a result, techniques vary widely and the evidence that they work is anecdotal at best. The AKC Canine Health Foundation has made the evidence-based practice of regenerative medicine a major focus within our research portfolio. Through an ongoing commitment to fund research studies that will inform the veterinary community in the use of safe and effective regenerative medicine techniques, we intend to protect dog owners and support veterinarians with innovative technology that will consistently improve outcomes for dogs.

In support of our effort to provide evidence-based regenerative medicine research, CHF is funding this landmark study to evaluate the effectiveness of Platelet-Rich Plasma (PRP) and stem cells in the treatment of...
the most common sporting injury in dogs: supraspinatus tendonopathy (similar to the rotator cuff injury in humans). Tendon injuries in dogs often progress undiagnosed and result in chronic lameness and pain. Ultimately, unassisted tendon healing results in scar formation and reduced function of the joint and surrounding muscle tissue. PRP and stem cell therapies aim to accelerate and promote healing through tissue regeneration and reduced scarring. Dr. Jennifer Barrett, MS, PhD, DVM, DACVS, DACVSMR, and Dr. Sherman Canapp, DVM, MS, CCRT, DACVS, DACVSMR, propose to conduct the first randomized, placebo-controlled clinical trial evaluating the effectiveness of PRP, adipose-derived, cultured stem cells (ASC) and commonly used stromal vascular fraction (SVF) cells. This will be the first study to directly compare efficacy of intratendinous injection of ASC versus SVF, both of which are currently commercially available despite having limited scientific evidence of efficacy. The study will be conducted at the Veterinary Orthopedic and Sports Medicine (VOSM) Group in Annapolis Junction, MD in order to recruit real-world cases in a clinically relevant, state of the art canine sports medicine environment. Using the gold-standard ‘Blinded, Placebo Controlled’ clinical trial design, Drs. Barrett and Canapp will not only identify an effective treatment for supraspinatus tendon injury, but their research will have a profound impact on the treatment of a wide array of musculoskeletal conditions affecting dogs and humans.

8. 01985: Defining Novel Drug Targets to Treat Chronic and Neuropathic Pain in the Dog
Principal Investigator: Dr. Ronald Sluyter, Ph.D.
Institution: University of Wollongong

Project Abstract: Through previous funding by the AKC Canine Health Foundation, Dr. Ronald Sluyter discovered a novel canine protein named the P2X Receptor. This receptor is responsible for movement of positively charged ions into cells and has been implicated in a wide range of cellular function in humans. Due to its ubiquitous expression and broad-based function, the P2X receptor is thought to play a decisive role in multiple diseases including chronic neuropathic and inflammatory pain, dry eye, irritable bowel syndrome, interstitial cystitis, dysfunctional urinary bladder, and cancer. In this grant Dr. Sluyter will focus on the role of the P2X receptor in pain in the dog. Chronic or long-lasting pain is a major health problem and welfare issue in dogs. Improved understanding of the mechanisms that define chronic pain will greatly aid in the development of new approaches and drugs to alleviate or treat chronic pain in dogs.

Grant for Bloat/GDV Research Approved

Also in April 2015, the Board of Directors unanimously approved a grant in the amount of $3,888 for Bloat/GDV research. The following proposal from Dr. Kyle G. Mathews at North Carolina State University, College of Veterinary Medicine and co-investigator Dr. Gabriela S. Seiler, Associate Professor of Radiology, North Carolina State University, College of Veterinary Medicine was received and approved.

Project Description: Gastric volvulus in humans is usually associated with abnormal function of the muscle between the chest and abdomen (diaphragm) or the nerve supplying this muscle. Evaluation of the diaphragm in dogs with GDV or breeds predisposed to GDV has not been previously reported. This pilot study will determine if there are obvious differences in the motion of this muscle when comparing dogs that have recovered from GDV to breed and age matched controls. If abnormalities are found using two non-invasive tests (video x-ray and ultrasound) then a larger follow-up study will be performed. Identification of abnormalities in diaphragmatic function may lead to the development of outpatient diagnostic tests to identify dogs at risk for developing GDV.

Objective/Hypothesis: To compare diaphragmatic motion in dogs that have recovered from GDV surgery to dogs of the same breeds/ages that have not suffered from GDV using fluoroscopy and ultrasonography. We hypothesize that diaphragmatic abnormalities in GDV dogs, indicative of denervation, will be identified.
**Literature Review:** Canine gastric dilatation-volvulus (GDV) is a common life-threatening condition. A mortality rate of 15% to 68% has been reported. One report estimated that 18-to-36,000 cases occur annually in the United States alone. Numerous hypotheses have been proposed and disputed as to the cause(s) of GDV in dogs - including: hypergastrinemia, pyloric outflow obstruction, abnormal gastric motility, deep-chested body conformation (eg. Collie, Great Dane, Irish Setter) and consumption of large meals prior to exercise. Deep-chested conformation may predispose to weakening of the gastric ligaments and subsequent volvulus, although stretching of these ligaments may be caused by rather than a cause of GDV. It is possible that these breeds may be at increased risk for developing GDV due to previously uninvestigated changes in the local neuromuscular anatomy, namely the phrenic nerves, and/or the diaphragm. Gastric volvulus in humans is uncommon and is usually associated with diaphragmatic abnormalities such as hiatal hernia or diaphragmatic eventration. It has also been associated with iatrogenic phrenic nerve damage and resultant diaphragmatic hemiparesis. Abnormalities in diaphragmatic anatomy or function theoretically predispose the human stomach to increased mobility, stretching of gastric ligaments and subsequent volvulus. Changes in diaphragmatic function require diaphragmatic EMG, phrenic nerve conduction studies, fluoroscopic (video x-ray) or ultrasonographic evaluation of diaphragmatic function for diagnosis.

**Preliminary Studies:** Our evaluation of phrenic and diaphragmatic biopsies taken from two dogs, and diaphragmatic biopsy from a third dog that died due to GDV revealed changes consistent with demyelinating neuropathy in the phrenic nerves of one dog, and the presence of atrophic myofibers (consistent with denervation) in the diaphragm of all dogs. We subsequently performed a pilot study investigating phrenic nerve conduction velocities and diaphragmatic EMGs following surface magnetic stimulation but found that the data collected using this methodology was inconsistent and often of low quality. Following that study, two things have changed which will allow us to complete the proposed investigation: 1) We have built a new fluoroscopic suite in which we can capture video of canine diaphragmatic motion, and 2) A recent article suggests that ultrasound may also be used to measure canine diaphragmatic motion in both normal and diaphragmatic paralyzed dogs. We have been able to use both imaging modalities to record diaphragmatic motion in normal large breed dogs.

**Experimental Design:** This protocol and the client consent form associated with it have been approved by the North Carolina State University Institutional Animal Care and Use Committee. We treat on average 10-12 GDV cases/year and have access to the data base of a local referral clinic that treats an equal number of cases. Dogs that have recovered from GDV surgery will be identified by medical records review. Owners will be contacted by telephone until six GDV affected dogs are enrolled in the study. New cases that present to our clinic during the next year will also be asked to enroll in the study. Once affected dog data has been collected, age and breed matched control dogs will be identified from medical records review and the owners contacted until 6 unaffected dogs with no current or past history of neurologic or gastrointestinal problems are enrolled in the study.

Shortly after admission, each study subject will be escorted to the fluoroscopy unit. They will not receive any medications or treatments. Each dog will stand on a platform that will allow us to record a video of diaphragmatic motion. A second video will then be obtained after jogging the dog to induce panting. No restraint other than holding onto the collar and the tail will be needed. Immediately following fluoroscopy the patient will be placed in lateral recumbency and an M-mode ultrasonographic image of diaphragmatic motion will be recorded from both sides of the diaphragm. All images will be recorded and then blindly evaluated. Subjective evaluation of diaphragmatic shape (fluoroscopy), and objective evaluation of excursion velocity (fluoroscopy and ultrasound), or excursion distance (fluoroscopy and ultrasound) will be recorded by a boarded radiologist unaware of treatment group. Accurate power analysis cannot be performed without initial data as these studies have not been widely reported in the dog. Power analysis will be performed post hoc if data is trending toward significance using students t-tests for objective data.
Grant Update!

Here’s the latest from Samantha Wright, Program Manager, AKC Canine Health Foundation on the AKC CHF Bloat initiative:

Grant 01935-B: Abnormalities in the Stomach’s Ability to Contract Predisposes Large-Breed Dogs to Bloat
Principal Investigator: Laura L. Nelson, DVM; Michigan State University
Grant Amount: $233,774.00

Grant Objectives:
1. To evaluate fasting gastric motility in High Risk (HR), Low Risk (LR), Wild Type (WT) and Affected (AF) cohorts of large and giant-breed dogs as a potential means of determining predisposition to GDV.

2. To determine whether plasma levels of motilin and ghrelin differ between WT, LR, HR, and AF cohorts of large breed dogs.

3. To identify a causal gene mutation associated with high risk of GDV.

Report to Grant Sponsor from Investigator:
We have made significant progress in the completion of this project in 2014. We have completed sampling of all unaffected Great Danes and 50% of our desired number of affected Great Danes. In addition, we have enrolled the majority of our WT controls and are beginning to contact and enroll Weimaraners and Bloodhounds, with plans to complete enrollment and sampling in spring and summer of 2015.

Results of motility evaluation at this time are preliminary, but we are observing a relationship between low fasting gastric pH and some breeds. Further sampling will help to demonstrate if this relationship is important. Use of the SmartPill wireless motility device has produced excellent studies. As we have enrolled only a small number of the GDV survivors of all breeds, we are looking forward to seeing what features of gastric motility are most common in GDV survivors. This will help us recognize if similar patterns are present at higher or lower levels in the other populations that we are evaluating.

At this time, evaluation of the relationship between GDV, GDV risk, and breed and blood levels of motilin and ghrelin (hormones that help to regulate gastric movement in the fasting state) is ongoing.

Finally, we have completed candidate gene analysis for MLN and GHRL, the genes for the motilin and ghrelin hormones, in the Great Dane. At this time, it appears that a mutation of these genes is NOT associated with GDV risk in the Great Dane.

DLA DIVERSITY FINAL REPORT

The following is a summary of the final report from Leigh Anne Clark, Ph.D., Department of Genetics and Biochemistry, Clemson University, describing their findings in the investigation of diversity at the dog leukocyte antigen II loci in American and international collies. The complete report will be posted on our website.

OBJECTIVES
The aims of this grant were to (1) investigate current level of diversity in American collies, and (2) evaluate diversity in international collies.
RESULTS

Aim 1: Investigate current level of diversity in American collies

Sample collection
Owners of AKC registered American collies were contacted by electronic methods to solicit research participants. Owners submitted cheek swabs (for DNA extraction), pedigrees, and information regarding age, coat color, and hair length. Forty-three collies selected for inclusion in the study were unrelated to each other within two or more generations.

DLA-DRB1 and DLA-DQB1 genotyping
Genomic DNAs were isolated using a commercially available kit. Portions of two genes, DLA-DQB1 and DRB1, were amplified according to protocols described in Kennedy et al. (2006) or Massey et al. (2013). Products were purified according to Massey et al. (2013), and sequenced directly on an ABI 3730xl Genetic Analyzer. Sequencing results were compared to published nucleotide sequences to determine genotypes (Robinson et al. 2013).

Findings
We determined that only one DLA-DQB1 allele (101) is present among American collies. At DLA-DRB1, there were two alleles (201 and 1501), but 93% of collies were homozygous for allele 201, indicating that 1501 is not a common allele.

Aim 2: Evaluate diversity in international collies

Sample collection
International collie owners were contacted by electronic methods. Many participants posted their contact information along with their collies’ pedigrees on: http://www.collie-online.com/pedigree/collie_DLA_alleles.php.
All selected participants were registered outside the United States and did not have an American sire or dam. We had to modify our original criteria to include collies unrelated within only two generations (instead of three) because of a lack of qualifying participants. Owners submitted cheek swabs (for DNA extraction), pedigrees, and information regarding age, coat color, and hair length. Fifty-six collies from 15 countries were selected for inclusion in the study.

DLA-DRB1 and DLA-DQB1 genotyping
Amplification, sequencing, genotyping, and allele designation was conducted as stated in aim 1.

Findings
The data generated in aim 2 showed that DLA-DQB1 allele 101 is the most common allele world-wide, but collies from Germany, Italy, Spain, and the United Kingdom possessed a second allele (701). Similarly, allele 201 is the most common DLA-DRB1 allele world-wide, but two additional alleles (601 and 1501) were observed in collies from several countries.
Because of the additional alleles present in international collies, 13% of dogs were heterozygous at DLA-DQB1 and 36% were heterozygous for DLA-DRB1.

CONCLUSIONS
There is limited DLA diversity in collies world-wide; however, the presence of even one additional allele in international collies enables higher heterozygosity levels than are observed in American collies. Heterozygosity for DLA genes is desirable because it can confer protection from certain autoimmune diseases.

REFERENCES


The Collie Health Foundation Welcomes the Following New Members

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Note: **indicates previous member…Welcome Back!

New Members – January 16, 2015 through June 30, 2015

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General Donations

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Grant & Pati Merrill
Gloria Bleidner
Collie Club of New England, Inc.
Ana & Julien Goulet
Judith D. Kirkeby
Carol Martin

In memory of Verna Allen
In memory of Verna Allen
In memory of Verna Allen. From Bleidner & Stamouli
To further continuing health issues
In memory of Virginia Perry Gardner
In memory of Treve, collie companion of Phyllis Howard and the late Bernie Howard
In memory of my smooth collies Heather, Candi, Cayla & Edward
Donations in Honor/Celebration/Memory  
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continued

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Susan K. Smith In memory of Trevor, CH Lisara's Blues Buster II. Love, Sue and Tess
Michael & Becky LaSpina In memory of Mrs. Frances Coleman of Merrytime Collies, CA
Dwight Kayto & Brenda Caswell In Loving Memory of our special boys - Denver, CH Prairiepine Dreamland Express and Parker, CH Uneeda Shoot for the Stars, CRNMCL
Brown, Lippert & Laite In memory of Griffin, a collie owned by Walter J. and Marie Hooper
Orville & Becky Crowley In memory of CH Linden Lane Autumn Fire "Tiffy"
Nannette Forrest General Fund
Alene Evans In Loving Memory of Pat Becker - Belfair Collies
Joe Reno In Memory of Verna Allen, Royal Rock Collies and Norwich Terriers
California Collie Fanciers, Inc. In loving memory of Fran Coleman, a lifelong friend to collies and their owners
Michael Sanderson In memory of Astrid Ware, CH Deep River Bad to the Bone, mother of Astro Sanderson, Deep River Hi Cliff Rocket Science CGC
Beverly A. Bain In memory of CH Timberlane's Glory and Beyond, Josephine.....you were so loved
Greater Tampa Bay Collie Club Proceeds from ornament fundraiser
Heartland Collie Club General Fund
Renee Millison In memory of Christie Reimer
Orville & Becky Crowley In memory of CH Provenhill's Divine Sun "Jordan" beloved pet of Nancy Van Note
John & Linda Morash Defreitas In memory of Bruschi's Proud Blue Patriot
Dr. Joseph & Pearl Friedman In memory of all of our wonderful collies and the joy and love they gave us
Robin Borck Sturgis In memory of Bruschi's Proud Blue Patriot
Ellen Van Embden General Fund
The Estate of Dr. Tyrone D. Artz Bequest
Gerrie D. Oliver In memory of Bev Hirt
Teri & Gerald Paul General Fund
Imre & Janet Szilagi In memory of Martha Ellen Hoffman

Matching Gifts
Donna J. Walle Corporate Matching Gift
Karin L. Johnson-Page Employee Matching Gift from Waters Corp.

The following donation from December was omitted from the last newsletter.  
Our apologies to the donor.

Nadine Beckwith-Olson In Celebration of Zuzu – Spectrum It’s A Wonderful Life

Correction to a donation listed in the Winter 2015 Newsletter

Bibi & Richard Hand In Memory of our heart dog Heatherri Molly Y.D. Long Face, MXP, MJP2, AXP, AJP, OAP, OJP, NAP, NJP, RL1, CGC, TDI, HIC 12/5/00 - 11/10/14
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