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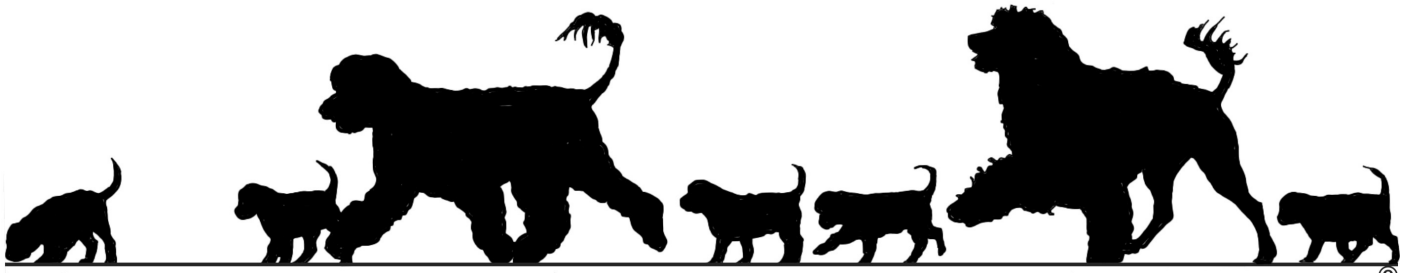

The Portuguese Water Dog Foundation, Inc.©

We are dedicated to funding canine medical research focused on issues that affect the health and well-being of Portuguese Water Dogs everywhere.

Inside this issue

Stay Safe, Stay Healthy

In these frightening and uncertain times, we hope you and your loved ones are able to stay home, avoid crowds and enjoy the extra time with your beloved dogs. We're trying to do the same.

Due to the COVID19 outbreak, changes in protocols and closings at most of the universities across the country may add delays for much of our testing. This is due mainly to reduced access to testing facilities. Please be patient with our researchers. Everyone is doing the best they can.

Stay safe and be kind to one another!

Microphthalmia Syndrome (PES) Tests

Margret L. Casal, DVM, PhD, University of Pennsylvania

At the beginning of the year, the Foundation and the PWDCA announced the Microphthalmia Syndrome test was available through PennGen. A combined JDCM/Microphthalmia Syndrome is offered discounted rate of $120. If you have previously tested your dog for JDCM, you can get the Microphthalmia Syndrome test for a discounted rate of $75.

Since that announcement was made, Dr. Casals happily reports that *hundreds* of tests have been submitted. She and her team have been working non-stop to get the results out. To help continue to get results out in a timely manner, and to help cover the costs for those individuals who submitted samples for research, the Foundation recently approved an additional $3,000 in funding.

Microphthalmia and delayed growth syndrome (aka "puppy eye syndrome" or PES) has been reported by Portuguese Water Dog breeders dating as far back as 1986. However, there has never been information in scientific literature and the majority of data concerning this syndrome has been obtained from records of breeders, which have anecdotal reports of the disease and little, if any, medical diagnostics.

Affected dogs present with microphthalmia of varying severity, other eye abnormalities, short stature and other findings. Preliminary pedigree studies suggest an autosomal recessive inheritance. Human literature reports numerous syndromes associated with microphthalmia, and many genes have been identified as having a causative role.

The originally objective of this particular study was to 1) clinicopathologically and molecularly characterize microphthalmia with delayed growth in the Portuguese Water Dog and 2) develop a DNA-based test to assist breeders with their breeding programs and avoid producing affected dogs.

Both of these goals were met, and a genetic test for PES was made available.

The Penn study has been one of our breed's most successful collaborative research efforts. In less than two years, research identified identified the disease-causing gene that allows us to identify potential carriers of Microphthalmia Syndrome in Portuguese Water Dogs.

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Progress Reports

Prevalence of Bartonella spp. Infection in Dogs with Cardiac and Splenic Hemangiosarcomas Within and Between Geographic Locations

Edward Breitschwerdt, DVM North Carolina State University

Splenic masses comprise ~50% of all canine splenic disease. Despite advances in imaging and pathologic definition, the etiology and medical relevance of splenic lesions in dogs are often ambiguous. While some splenic tumors are benign, approximately two-thirds are highly malignant and carry a poor prognosis. Hemangiosarcoma (HSA) accounts for the majority of canine malignant splenic tumors and occurs in many large dog breeds, including mixed breeds. A less common site of HSA localization is the heart (cardiac HSA). Risk factors for both cardiac and splenic HSA remain unclear, confounding development of preventative strategies. The investigators recently reported a high prevalence of species of the bacterial genus *Bartonella* in dogs with HSA from North Carolina, suggesting a potential role in the initiation and/or progression of this cancer. *Bartonella* species exist worldwide and are transmitted by blood-sucking arthropods (e.g. ticks, fleas) and their presence in splenic tissue could potentially be explained by the fact that the spleen is primarily responsible for removal of blood-borne parasites from the systemic circulation. The investigators will perform a comprehensive examination of the potential association between *Bartonella* infection and HSA by comparing the prevalence of *Bartonella* DNA in tumor and blood samples from both splenic and cardiac HSA cases, and also within and between distant geographical locations in the US. Ultimately, demonstration of a robust association between *Bartonella* infection and the development of HSA may lead to new opportunities for improved diagnosis, treatment and prevention of this devastating cancer.

Researchers have now completed all Year I study aims, with the exception of immunohistochemistry and FISH localization of *Bartonella* organisms within various cell types. A high percentage of dogs with hemangiosarcoma were found to also be positive for *Bartonella*, a tick-borne disease. *Bartonella* infection may be a factor in tumor development because it increases blood vessel growth and inflammation within the body. Further studies are needed, and ultimately a vaccine to protect dogs against *Bartonella* infection could potentially decrease the prevalence of hemangiosarcoma.

Defining the Mechanism by Which Ticks Locate Dogs in Order to Better Prevent Disease Transmission

Emma Weeks, PhD, University of Florida

The brown dog tick (BDT) is common across the US and the most widely distributed tick in the world. BDT's are capable vectors of pathogens that cause canine ehrlichiosis and babesiosis as well as other disease agents. Prevention of these diseases is accomplished through tick control. BDT's can complete their entire life cycle indoors, making management difficult. Records of infestations are increasing and unpublished data indicates that a high level of acaricide resistance is present in domestic populations. Consequently once introduced, these ticks are particularly hard to eradicate and as one female tick may lay 5,000 eggs, the problem soon gets out-of-hand. Acaricide resistance leads to aggressive treatment regimes, which in turn, leads to increased exposure of humans and pets to acaricide residues. Alternatives to pesticide applications are needed. Studies have shown that BDT's are attracted to dog odor, a blend of volatile chemicals used by ticks to find a blood meal. Identification of the chemicals BDT's use to locate a dog (semiochemicals) would enable manipulation of tick behavior thereby facilitating management and reducing the need for extensive use of acaricides. Improved tick control without the need for increased acaricide applications will improve the quality of life for dogs and their owners or handlers. Work will be accomplished through four successive objectives to 1) collect dog odor, 2) identify chemicals that ticks can detect, 3) test chemicals for tick attraction and ultimately 4) evaluate efficacy of an attractant-based tick trap.

For the first objective, the collection of dog odor, all animals have been identified and the samples have been collected and analyzed by chromatographic techniques.Furthermore, the chemicals have been identified tentatively by mass spectrometry. For the second objectives the electrophysiological techniques have been established and ten ticks have been tested

PROGRESS REPORTS, CONTINUED

against each dog breed sample plus a mixed sample of all dog breeds (Total 60 ticks). Comparisons between the electrophysiological responses by breed have been made and those peaks producing consistent responses in tick sensory organs have been identified. For the third objectives the behavioral assay has been established. Attraction has been demonstrated to whole dog hair samples and positive controls. Further studies will test the electrophysiologically active chemicals in the behavioral bioassay to determine behavioral role and impact. The most attractive chemicals will be tested in a semi-field trapping system for potential use in a monitoring device.

Identifying the Disease-Defining Autoantibodies in Canine Addison's Disease

Steven Friedenberg, DVM, PhD, University of Minnesota

Addison's disease is a common and life-threatening disorder in dogs in which the body's immune system destroys the outer layer of the adrenal glands. The adrenal glands produce hormones that are critical for energy metabolism, immune system function, intestinal health, and kidney function. Symptoms of Addison's disease can mimic other conditions, and as a result, many dogs remain undiagnosed for years. About one-third of dogs with Addison's disease are diagnosed only after suffering an acute adrenal crisis, which can cause a wide range of complications that require emergency stabilization and hospitalization. Today, there is no way to predict which dogs will develop Addison's disease before they become sick. If such a test were available, veterinarians would be able to evaluate high-risk dogs before they show signs, helping to prevent disease-related complications and potentially enabling earlier treatment.

During the initial 1.5 years of this project, we focused our efforts on sample collection across our three target breeds (Standard Poodles, Portuguese Water Dogs, English Cocker Spaniels). We have collected nearly all the required samples from Standard Poodles and Portuguese Water Dogs. Currently, we are focusing our efforts on increasing the number of English Cocker Spaniels we have enrolled in the study. We are also actively recruiting newly diagnosed patients across all three breeds through many online resources. Over the past 6 months, we have started to use these samples to (1) document the presence of autoantibodies in dogs with a new diagnosis of Addison's disease and (2) determine the protein target of these autoantibodies. This work has made use of two techniques: immunofluorescence assays and Western blots. These techniques have similarities insofar as they can both document the presence or absence of autoantibodies, but by slightly different methods. Our early work suggests that there may be a population of autoantibodies that are unique to dogs with a new diagnosis of Addison's disease in Standard Poodles and PWDs (English Cocker Spaniels have yet to be evaluated). We are actively working to confirm these findings. Once this has been accomplished, we will attempt to determine the target protein of these autoantibodies.

The Role of Complex Translocations Associated with TP53 Somatic Mutations for Aiding Prognosis of Canine Diffuse Large B-Cell Lymphoma

Matthew Breen, PhD, NorthCarolina State University

This study involves the evaluation of a cohort of canine lymphoma specimens for the presence of tumor-associated abnormalities associated with four key cancer-associated genes (MYC, BCL6, BCL2 and TP53). The presence of these abnormalities, alone and in combination, has been shown to be predictive of the response to standard treatment modalities in human lymphoma patients, and provides powerful opportunities to predict prognosis in newly diagnosed patients. We hypothesize that the same may apply in dogs. We have screened the full cohort of canine lymphoma cases for structural and numerical abnormalities involvingMYC, BCL6, and BCL2. Overall the data suggest that rearrangement of the genome at the MYC and BCL6 loci is relatively rare within any given case, and occurs at a frequency similar to what is seen in human DLBCL (Li et al. 2018). While BCL2 rearrangementis highly infrequent in dogs (seen in only 2% of cases), and has a generally neutral copy number status, our initial analysis suggests an association of this event with disease-free interval. In an earlier study we showed that the incidence of BCL2 rearrangement and copy number imbalance is low in canine follicular lymphoma (Thomas et al. 2017). The rarity of this B-cell lymphoma subtype in the dog limited the ability to draw generalized comparisons with the human counterpart; however the present study suggests that these observations can be extended to other more common canine B-cell lymphomas. Analysis to date suggests that neither BCL6 nor MYC rearrangement is significantly associated with disease free interval. Assessment of the copy number status of both of these loci concur with previous studies (Thomas et al. 2011), with MYC demonstrating a trend toward copy number gain and BCL6 demonstrating largely neutral copy number status.

DNA sequencing analysis of the TP53 gene has revealed a diverse series of variants among those cases analyzed to date, the majority of which are clustered within a small genomic interval. Almost all variants are simple in structure but are predicted to have a deleterious effect on the function of the gene. We identified variants for which the equivalent alteration is highly recurrent in human tumors, including two key variants that have been reported previously in canine lymphomas, adding to their potential clinical significance. A subset of specimens yielded sequencing data that did not meet our quality control criteria. These specimens showed a high level of DNA degradation, which is likely a consequence of prolonged exposure to formalin during the processing of the biopsy specimen for histologic analysis. Formalin exposure creates crosslinks between DNA and protein, which can confound downstream analyses, including DNA sequencing analysis. By modifying our DNA extraction protocol we were able to ameliorate this confounding factor for the majority of cases that originally failed to yield good quality TP53 sequence data; however a small number of cases remained intractable to this analysis. We were able to substitute these cases for alternates from our sample repository, and are now processing those specimens for genomic analysis. On completion we will integrate genomic data for each of the four genes studied for each case, and examine their status in context with patient outcome, to determine their potential as clinically predictive markers for canine lymphoma.

PROGRESS REPORTS, CONTINUED

Targeting the Cancer Epigenome: The Effect of Specific Histone Lysine Methyltransferase Inhibition in Canine B-Cell Lymphoma

Angela McCleary-Wheeler,DVM, PhD,University of Missouri

Lymphoma, particularly the large, B-cell subtype, is one of the most common malignancies in dogs. Canine lymphoma can be treated, but it is rarely cured. Novel therapeutic strategies are necessary to improve outcomes in dogs diagnosed with lymphoma. Recently, advances in the understanding of human lymphomas have focused on the area of epigenetics. One area of this research involves understanding how genes are turned on or off based on different modifications to histone proteins, a specific group of proteins that interact with DNA. Specific enzymes that modify these histone proteins have altered activity that can lead to lymphoma development in human lymphomas. One of these enzymes is EZH2.Increased activity of EZH2 has been shown to play an important role in the development of some human lymphomas. Data from a Phase I study of an EZH2 inhibitor, tazemetostat, in relapsed or refractory human B-cell, non-Hodgkin lymphoma has shown to be a safe, oral therapy with potential clinical benefit. The role of EZH2, however, has not been evaluated in canine B-cell lymphomas to date. Given the similarity between human and canine B-cell lymphoma, we seek to investigate whether EZH2 activity plays a role in canine B-cell lymphoma. To do this, we use canine lymphoma cells and specific EZH2 inhibitors, including the tazemetostat used in early human studies, to evaluate the effect of EZH2 inhibition on cell growth and survival. Our data suggest that this inhibitor is highly potent and effective for inhibiting EZH2 effects on histone modification in canine lymphoma. This is important as this inhibitor is an orally bioavailable drug with a good toxicity profile in humans, making this inhibitor a candidate for clinical trials in dogs with lymphoma. Initial data suggests that EZH2 inhibition may not impede lymphoma cell proliferation or survival. However, we have confirmed that some genes that regulate the ability of canine lymphoma cells to replicate are altered with EZH2 inhibition. Specifically, one gene, CDKN1a, is turned back on when EZH2 is inhibited. The activation of CDKN1a is repeatable and profound. We will be continuing this work with a sequencing approach to further understand what genes are regulated by EZH2 in canine B-cell lymphoma cells. Our findings are suggesting an importance for EZH2 in canine lymphoma and for continued investigations into cell cycle regulators that may be abnormal. By understanding the genes regulated by EZH2, we can characterize the role this histone modifying enzyme has in canine lymphoma. Moreover, we can assess how inhibition of EZH2 activity may be utilized clinical in dogs with lymphoma.

Identifying Cellular Mechanisms of Inflammation During Canine Tick-Borne Diseases

Christine Petersen, DVM, PhD, University of Iowa

The overall goal of this study was to determine differences between dogs with asymptomatic versus symptomatic Lyme Disease, in order to better understand which cell types, or inflammatory factors produced by them, are helpful for controlling the disease.In this study, we identified sporting and hunting dogs at different clinical stages of Lyme Disease and sampled blood from them in the field. We have confirmed our field diagnoses with specialized assays performed by IDEXX Laboratories. In the lab, we have analyzed the percentage of Natural Killer immune cells and some markers of the activation state of these NK cells in the blood. We have found multiple interesting aspects of the canine immune response to Lyme Disease which were not previously known, and in fact will be novel contributions to the LD immunological knowledge, due to our ability to learn from asymptomatic exposed dogs which has not been done in people. We have found one subset of these cells, NKT cells, increased in dogs exposed to the bacteria that causes Lyme Disease, Borrelia burgdorferi, but do not show symptoms of Lyme Disease (asymptomatic dogs). Therefore, we hypothesize these cells are helpful in preventing Lyme Disease symptoms. The NK cells from dogs with symptomatic Lyme Disease showed a statistically enhanced inflammatory response in the presence of Lyme Disease causing bacteria, indicating that excessive inflammation may contribute to clinical disease. Additionally, a serum cytokine was elevated in asymptomatic dogs, thus this cytokine could be skewing the NK cell subset toward a less inflammatory phenotype to prevent disease. This cytokine may represent a novel therapeutic to help drive the immune response towards a healing phenotype. Finally, we have observed that NK and/or NKT cells from dogs exposed to Lyme Disease causing bacteria are able to kill target cells similar to healthy control dogs. This is further evidence that increased inflammation, and not an inability to kill bacteria, drives most of the clinical symptoms of canine Lyme Disease. Based on these results, therapies targeted towards decreasing NK cell-mediated inflammation, or to increase serum cytokines associated with NKT cell differentiation may help dogs maintain an asymptomatic state following Lyme Disease exposure. Throughout this study, we have established a good working relationship with the caretakers of the hunting and sporting dogs and have collected enough samples to meet our statistical needs for these experiments.

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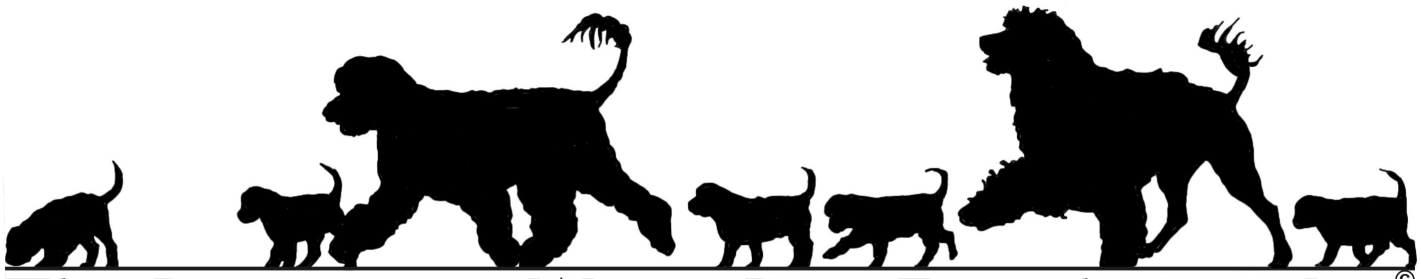

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The Portuguese Water Dog Foundation, Inc. needs your help and support to fund research to improve the quality of life and health of our Portuguese Water Dogs. Your tax-deductible donation, in any amount, would be greatly appreciated. In addition to personal donations, a donation may be made in memory or honor of a friend or loved one, whether human or canine. Donors' names will be kept anonymous upon request.

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Thank you to all of you who support the efforts of The Foundation. We appreciate every dollar you donate. And we still have much to accomplish. This list includes people who contributed between July and December 2019.

Commodore $1,000 and up

Janice Butler in honor of Angus, Zander, Bella and all those special PWDs that have touched my heart over the years! Love you all, miss so many!

Marc Erik Elias

Craig Fisher in memory of his mother, Ruth Fisher

Morgan Jennings in memory of "Max" and "Maggie"

Morgan Jennings for Shine On Project

Jayne Kenyon & Trezena Kennels in loving memory of E. Niles Kenyon

Barbara & Donald Niemann

Dr. J. D. Northway in memory of Ann Northway and PWDs Cassie, Splash & Polly

PWD Jamboree 2019 – Shine On

Sidney Schuler in memory of "Luna"

Tom & Peggy Weissenborn in memory of Intl CH Baron, CH Ripley & Jeremy

Gloria & Mike Sullivan in honor of Del Sur's Shut Up N Kiss Me, and in appreciation to Kathy Maguire

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Roberta Capuano and Tom Heffernan in honor of Jane Freeman with love and gratitude for all she does for the breed and owners, and special thanks for "Dutchie", "Piper" and "Jibe."

Verne Foster in loving memory of "Sloopy" OTCH CnSand Freudian Sloop UDX2 OM3 WWD RE SWA TKA DDI DDCI who died of Hemangiosarcoma

Friends in honor of Margaret White

Lisa Grote & John Northway in memory of Ann Northway and PWDs "Cassie", "Splash" and "Polly"

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Roberta W. Knight in memory of all my beloved PWDs who enriched my life

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Sarah Leatherman for Shine On Project and in honor of Luna's contribution and 12th Birthday

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Jim & Judy Kamman

Marlene Kinkead in honor of Rivendell Cutter and Caladesi Roxanne who make everyday a wonderful journey!

Carolyn Knutson

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John Piper & Deborah Tuttle in memory of Rosie & Rebel Piper, our beloved Portuguese Water Dogs, forever loved & missed.

Joan E. Sennett

Marti Touchstone & Rick Clark in loving memory of "Potion" OTCH MACH Great Lakes Magic Punch UDX4 PUTD OM6 BN GN VER RM RAE MXB MJS MXP2 MJP2 XF T2B TKA CWDX GROM. Our dog of a lifetime and the seven year journey we will remember and cherish every day until we see her again. Mom & Dad

Robert Yellowlees in memory of "Bear"

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Lori Basher in loving memory of "Mac" who died of Hemangiosarcoma

John & Sarah Brock in memory of Grady

John & Sarah Brock in congratulations on your new title to "Kina" for her MWD!

John & Sarah Brock in congratulations on your new title to "Cruiser" for his MWD!

Marlene Bunch in memory of my sweet, happy & handsome "Charlie" Zohar's Whispering Wisdom. Sylvie & I miss you so much.

Sandra Coleman & Paul Hancock

Shirley Coleman

Colorado PWD Club in memory of "Nikki" Far Away Hermione Granger loved and missed by Deb Bender

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Rick & Cindy Eastman in memory of our sweet, loving "Elly"

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Thomas & Linda Majcher

Pamela Marshall

Terri McConnell in memory of "Teddy" and "Tucker"

Andrew & Laura McCullough, Jr. in honor of our PWDs!

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Mosie & Hava Oberndorf

Marian Ormont

Phelan Family

Janice Plummer in honor of "Millie" CH Asta's Moonlight Serenade

PWD Club of the Twin Cities in thanks to Lauren McDermott for judging our 2019 water trial

Stan & Milarie Rude in memory of "Bob" Bayswater's Bubbles In My Beer

Elaine Selsberg & Dan Recht in memory of Timbermist's Toti & Niya, and in honor of Joyce Vanek and her dedication and commitment to the health and well being of PWDs

Randy & Geri Smith in honor of Ada!

Jim & Phyllis Stanton in loving memory of "Augusto" 1997-2011

Kathy & Ken Tallering

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Colorado PWD Club in memory of Twyla Buzick and in gratitude for her contributions

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Claire DeChristina & Curt Reif

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Roslyn Eskind

Fran & Paul Fehling in honor of Daisy & Calvin

Carol & Henry Goldstein in memory of "Nikko"

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Linda K. & Krista K. Hunt, Kalista in memory of Tom Kaiser, loved and missed by Beryl Nord, Praia Norte

Sandy Iwaszko in honor of the PWD PSG

Giene Keyes in honor of the PWD PSG

Candace Lawhorne in honor of the best companion, Folly

Sally & Greg Merz

Louise Mowbray

Suzette & Barry Pangrle in honor of the PWD PSG

Nancy & Jack Perkins

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Julie Rust in honor of the PWD PSG

Linda K. Shultz in honor of Ellie's Neaptide puppies

Kim & Peter Swanson in memory of "Belle Bell" Carmars Belle Of The Ball, loved and missed by her family

Philip & Marilyn Tierney

Nancy Vener in memory of "Rivets" Moleiro's Riveting Reflection

Barbara Vogelmann in honor of the PWD PSG

Mary Warner in honor of "Echo", "Myles" & "Dobbie"

Elana Winsberg & Michael Barber in memory of "Tinker" and "Marisol"

Kimberly & Jerome Wolcoveick in memory of Alice Vicha and all the Norvic PWDs

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Laurie & Craig Elmets in memory of "Quincy" MACH Sunnyhill Queen Of The Sea, loved and missed by Laurie, Craig & David Elmets

Eleanor & Edwin Fuller

John Haeger in memory of "Rudi" Crews'n Ports Rudolph's Glo CD

Melinda Harvey in memory of "Rivets" Moleiro's Riveting Reflection

Melinda Harvey in memory of "Maggie" Redwoods Precious Pearl

Carol Hillman in memory of "Riva Ridge" a sweet girl

Linda K. & Krista K. Hunt, Kalista in congratulations on your new title to "Hydro" CH Kalista To Splash-N-Dash BN RN MX MXJ CGC TD TKI SCA SIA SRO RATO WWDX SROM for his WWDX!

Linda K. & Krista K. Hunt, Kalista in memory of "Lexi" Kalista's Lexicon Of Love loved and missed by Brian & Kim Delgado & family

Linda K. & Krista K. Hunt, Kalista in congratulations on your new title to "Lyra" Kalista's Vega A Lyrae RN TKI SEN AWD for her SEN!

Linda K. & Krista K. Hunt, Kalista in memory of "Razz" CH Bayswater's Razzle Dazzle UD RN OA AXJ OAP OJP CWDX GROM loved and missed by Mary-Kay & Jerry Schroeder

Linda K. & Krista K. Hunt, Kalista in memory of "Marco" Kalista's Let's Play Two loved and missed by Andrew & Shari Barden

Linda K. & Krista K. Hunt, Kalista in congratulations on your new title to "Trip" Kalista's Asked 'n Answered AWD DM for his AWD!

Linda K. & Krista K. Hunt, Kalista in memory of "Zora" Kalista's Zora the Duck Explorer loved and missed by Judy Cheguis

Linda K. & Krista K. Hunt, Kalista in congratulations on your new title to "Trip" Kalista's Asked 'N Answered WWD DM for his WWD!

Linda K. & Krista K. Hunt, Kalista in congratulations on your new title to "Polo" Kalista's Pursuit Of Happiness WWD for his WWD!

Linda K. & Krista K. Hunt, Kalista in memory of "Minnie" Kalista's J'adore Minnetonka loved and missed by the Seiler family

Linda K. & Krista K. Hunt, Kalista in congratulations on your new title to "Tally" GCH CH Kalista's What A Catch WWD RI TKI CGC for her RI!

Linda K. & Krista K. Hunt, Kalista in congratulations on your new title to "Lyra" Kalista's Vega A Lyrae RI SWN TKI AWD for her RI!

Deck Hand up to $49 (continued)

Linda K. & Krista K. Hunt, Kalista in congratulations on your new title to "Beckon" Kalista Zummon With A Wave URO1 for his URO1!

Linda K. & Krista K. Hunt, Kalista in memory of "Kiwi" Kalista's Our Little Houdini, loved and missed by Kathleen Skeels and Douglas Nufer

Linda K. & Krista K. Hunt, Kalista in memory of "Sloopy", loved and missed by Verne Foster

Linda K.& Krista K. Hunt, Kalista in congratulations on your new title to "Qiwi" Kalista's Quantum Leaper NF CGC NW3 for her NW3!

Linda K. & Krista K. Hunt, Kalista in congratulations on your new title to "Kuper" CH Kalista's Terciero OA OAJ for his OA!

Linda K. & Krista K. Hunt, Kalista in congratulations on your new title to "Mini" Kalista's Wanna Keeper NA OAJ for her OAJ!

Peg Jeffries

Richard Kesin

Barbara Lachney in memory of "Koebie" Aquamarine's Sky Fire Koebie

Barbara Martin

Karen Matthews

Debbie & David Minkoff

Sandy Novicki in memory of Sailor

Susan Pemberton

Traci Responte

Southern California PWD Club in memory of "Whirly" Amarinhar Caracolar NA NAJ AXP AJP NF CWDX

Southern California PWD Club in memory of "Ginger" Anekalia'i Wainani CD RE OA NAJ OJP OF CWDX

Southern California PWD Club in memory of "Jazz" CH Peja Jazz Man Of Cub Run CDX RA MX MXJ MJP NF CWDX

Willa Speiser in memory of "Atticus" and in honor of "Cicero"

Barb Stanek in memory of "Rudy" & "Trio"

Robert & Cynthia Strouse in honor of Zeke & Mari Strouse

Katherine Twain

Todd & Christine Williams in memory of "Molukie"

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Special Report

Analysis of the Health, Behavioral, and Longevity Data Collected in the 9/11 Medical Surveillance Longitudinal Study

Cynthia Otto, DVM, PhD, University of Pennsylvania

Following the attacks of September 11, 2001 on the World Trade Center and Pentagon, the AKC Canine Health Foundation awarded funds to the only lifetime longitudinal study tracking the medical and behavioral impacts of a major national disaster on the health and behavior of search & rescue (SAR) dogs. On June 6, 2016, the last study dog was laid to rest and data collection for the 9/11 Medical Surveillance Study was concluded. With 15 years of data, including annual radiographs, bloodwork, and handler surveys (health, performance, and behavior), the opportunity for in-depth analysis and discovery of new best practices and protocols for SAR dogs has never been greater. Data collected from deployed dogs will be compared to data collected from control SAR dogs that underwent similar training and careers, but did not deploy to 9/11. The investigators will explore three key areas of data: behavior, occupational hazards, and longevity related to health and work. Critical information gleaned from this study will have major implications applicable to the development, training, and care of our nation's SAR dogs, other working canines, and even companion dogs. Results will improve our understanding of traits of successful SAR dogs and thus influence dog selection. Importantly, following characterization of trait heritability, this data could be critical to a focused breeding program. The complete analysis of t he occupational hazards of SAR dogs will shape preventive practices to allow these dogs to safely and effectively fulfill their mission of saving human lives.

Data collected over the 15 years of the 9/11 study represents a massive amount of never before available information on the short and long-term impacts of a search & rescue deployment on the health and behavior of the search dog. The data analyzed in this project cover three areas: behavior, occupational hazards, and longevity. With the ever changing and improving methods for data collection, the research team has spent most of the time tracking, organizing, validating and preparing the 15 years of behavior data to be analyzed. The foundations of data for all of the analysis is now in place and the remaining missing data has been tracked down and entered for the CBARQ, retirement and longevity. The health data is being reviewed to optimize the approach to the analysis. The creation of a master database has been an intense project, but now the majority of data is in a form that will allow efficient analysis and cross referencing for the several important questions regarding behavior, health and longevity that we have proposed. We have valuable information about behaviors that are associated with deployment status, neuter status, certification type and retirement status. At least one CBARQ from each of the 150 dogs was included in the analysis, with a median of 6 completed CBARQs per dog and a range of 1-13. The population includes 65 females (43%) and 85 males (57%). The German shepherd was the most common breed (37%) followed by Labrador (27%) and Golden retriever (9%). Dogs still in their working careers accounted for 461 CBARQs (67%), 197 CBARQs (29%) were from retired dogs, and retirement status was missing for 29 CBARQs (4%). The categories of Trainability, Attention Seeking and Energy all decrease with age, independent of deployment status. Touch Sensitivity was not influenced by age. Excitability differed by deployment status. Deployed dogs started high and gradually decreased with age, Control dogs started low, increased to a peak and then decreased with age. No dog was retired in year 1, by year 10 all participating dogs were retired.