WESTIE FOUNDATION OF AMERICA, INC
Leading the Way to Westie Health

Westie WELLNESS

Summer 2019

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IN THIS ISSUE

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PRESIDENT'S MESSAGE

Bebe Pinter

Do you include your Westies as part of your family and loved ones? Our dogs mean the world to us. We want to do all we can to give them the best lives possible and we want to insure future generations of Westies enjoy good health and long lives. Did you know you can leave a legacy to help make that happen?

Including the WFA in your will or trust is a meaningful way to help improve the health of all West Highland White Terriers in future generations and to educate breeders, pet owners, and veterinarians. Many of WFA's research grants and educational services have been made possible by individuals who had the vision and foresight to include the WFA in their estate plans. If you have questions about making a legacy gift to the WFA or to learn more about the The Legacy Alliance Program, please call or email us at: president@westiefoundation.org or visit our website www.westiefoundation.org.

Randy Cantrell writes about his life with Westies Rocky and Rosie and how he came to volunteer for the WFA as a director. Randy said, "I am devoted to helping the WFA because the promotion of Westie health is paramount to Westie owners and lovers worldwide."

The WFA is honored to share an academic paper "*Research in Pulmonary Fibrosis Across Species: Unleashing Discovery through Comparative Biology*" recently published in *The American Journal of Medical Science*s. This paper is based upon our three-day workshop *Fibrosis Across Species* held in May 2014 and includes conclusions, challenges and recommendations. We sincerely thank our donors, research participants and sponsors for their support.

Please note the article "*WFA-Funded study makes unexpected findings in disease affecting 10 percent of canine breeds—Cornell Atopic Study May Help Improve Diagnosis, Treatment of Westies with Atopic Dermatitis, At-Risk Westies, Other Breeds*" by Teresa Barnes, VP Communications. WFA wrote in the Summer 2018 issue of this newsletter that this research project could be pivotal in predicting a puppy's future allergic response which would allow breeders to make more informed decisions with dogs at an early age. Thank you to our donors and to the

(Continued on page 2)

(President continued from page 1)

New Zealand West Highland White Terrier Club that provided 50 percent funding in the grant.

Read "*Westie Foundation of America Awards Second Veterinary Scholarship*" to find out the veterinary professional that was awarded the 2019 grant.

Then, "*Daphne Gentry Veterinary Scholarship Winner's First Year*" by Dr. Chie Tamamoto-Mochizuke describes her progress as the 2018 winner in her own words. We are delighted with this program and encourage your donations to the scholarship fund to help assure that it continues into the future.

"*Financial Report—Fiscal Year 2018*"—Once again, we are proud that Program Services represents a robust 84 percent while Management (5%) and Fundraising (10%) are closely monitored.

Nutrition is so important! Consider the article "Could Grain-Free Diets Damage My Dog's Heart?

Teresa Barnes explains in "*Westie Owners Triumph, Raise Funds for Innovative PF Study*" how PJ Kessler and Westie owners have made history. The Pulmonary Fibrosis study is now underway with Yale and Tufts Universities. Our heartfelt sympathies go out to PJ Kessler and others who have lost their dogs to this horrible disease.

Check out the Research Progress Report Summary on "*Effect of Lokivetmab on Tissue Biomarkers of Canine Atopic Dermatitis using RNA Sequencing*." Data has been collected and results are being compiled.

Thank you for your continued involvement and support of the WFA but most of all, your love of Westies!

Bebe Pinter

WESTIE FOUNDATION OF AMERICA, INC

Leading the Way to Westie Health

Request for Samples

RESEARCH PROJECT	SAMPLES NEEDED	CONTACT INFORMATION
Genetic marker for **Atopic dermatitis**	Saliva swabs or blood samples from dogs with skin disease or from normal dogs 5 years of age or older from family lines free of allergies	Kim Williams North Carolina State University 919-513-7235 kdwilli4@ncsu.edu
Genetic susceptibility of **Bladder Cancer (TCC)**	Blood samples from dogs diagnosed with TCC and dogs over the age of nine who have no known cancers	Gretchen Carpintero Ostrander Lab National Human Genome Research Institute 301-451-9390 Dog_genome@mail.nih.gov
Genetic marker for **Addison's disease**	DNA from cheek cells and/or blood from affected dogs and unaffected dogs over the age of 7	Dr. A.M. Oberbauer UC Veterinary School (Davis) 530-752-4997 http://cgap.ucdavis.edu/
Clinical Features and Genetic Basis of **Idiopatic Pulmonary Fibrosis (IPF)**	Blood samples from dogs diagnosed with PF and healthy dogs over age 8 without lung disease	Drs. Ned Patterson and Peter Bitterman Katie Minor (contact) University of Minnesota 612-624-5322 minork@umn.edu
Idiopathic Pulmonary Fibrosis (IPF)	Cheek and/or blood samples from dogs diagnosed with pulmonary fibrosis	Dr. Victor J. Thannickal University of Alabama Sample collection coordinated by Dr. Pamela Whiting, DVM pgwhitingdvm@aol.com 707-529-9222 (cell/text) 707-837-8101 (clinic)
Dry Eye Syndrome (keratoconjunctivitis sicca)	Dogs diagnosed with dry eye and dogs over 7 years old with no ocular abnormalities *participants must be available for appointments at UC Davis Veterinary Center (CA)	Dr. Sara Thomasy UC Veterinary School (Davis) 530-752-1770 smthomasy@ucdavis.edu
Mechanisms of Allergic Disease (Atopic Dermatitis)	Blood samples from allergic dogs and non-allergic dogs	Elia Tait Wojno, PhD Cornell University of Veterinary Medicine 607-256-5635 Edt42@cornell.edu

For more information about any of the above projects visit
www.westiefoundation.org

On The Health Front

By Kay McGuire, DVM, MS

I was fortunate to attend the American Kennel Club Canine Health Foundation (CHF) conference held the weekend of August 9th-11th in St. Louis, MO. We had two and half days of inspiring presentations by renowned scientists on the newest health research sponsored by the Canine Health Foundation. There was a great deal of information on the use of probiotics for treatment of vomiting, diarrheas, their use as immunomodulators, and their use in anxiety treatment. It is important to note that there are different strains of probiotics available, some of which are better for individual problems. With many probiotic sources on the market, it is vital to know if the bacteria contained are actually what is claimed to be and also if they are still alive at the end of their shelf life. Consider the quality control measures when making your choice.

Another hot topic at the meeting was the progress in understanding Addison's disease. The breeds over-represented with Addison's disease are Standard Poodles, Beagles, Portuguese Water Dogs, Leonbergers, Bearded Collies, and Westies. The incidence of Addison's Disease among purebred dogs is 0.36% and 0.33% amongst all dogs. Lack of appetite, weakness, vomiting and/or diarrhea, hyperpigmentation of skin, increased thirst and urination and mood changes can all be symptoms noted in affected dogs and humans. Research is targeting methods to predict affected dogs by understanding environmental triggers and identifying changes in the genome.

Tick borne diseases such as Bartonella, Lyme, Babesia, Rocky Mountain Spotted Fever, and Erhlichia are known to mimic auto immune disease, with the pathogens lying dormant for months. Bartonella is known to trigger Auto Immune Hemolytic Anemia, polyarthritis, thrombocytopenia, and glomerulonephritis. Bartonella is also known to cause bacterial diseases such as valvular endocarditis and bacteria are known to be responsible for 25-50% of all cancers in humans. Bacteria cause oncogenesis (cancer causing) by chronic inflammation, cell proliferation, hormonal alterations, secretion of oncogenes proteins, and secretions of toxins. The bottom line: flea and tick prevention for our animals is a must throughout the year.

Dr. Jerald Bell presented an update on how to evaluate genetic testing in our dogs. His concern over the gene panels which test for every known genetic mutation in dogs are misleading and misused in selecting breeding animals. If a dog has two copies of an affected gene of a particular genetic disease, it can be misinterpreted if that disease is not prevalent for that breed. At this time, only three genetic diseases can be tested in the Westie: Craniomandibular Osteopathy (CMO), pyruvate kinase deficiency, and globoid cell leukodystrophy.

The current laboratory recommended for CMO testing is VetGen. The cost per test is $55, but if contacted to order test kits, VetGen will offer discounts for multiple tests. VetGen is also offering special pricing associated with Montgomery KC. I will have some test kits at Kimberton and VetGen will honor the special rate for a month post Montgomery week. As health chair, I am recommending that CMO testing be added to the Westie CHIC health clearance requirement. CMO is one disease we can eradicate from our breed with a simple cheek swab sample.

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(On The Health Front continued from page 3)

The West Highland White Terrier Club of America and the WFA are hosting our **annual Health Seminar on Thursday, October 3rd at the Kimberton Fire House at 6:30 PM**. Our speaker will be Dr. Clare Wiley, VMD, DACVIM on:

Early Detection: Advancements in Bladder Cancer and Renal Dysplasia

Dr. Wiley, a clinician investigator at NC State, earned her veterinary degree and completed a rotating internship at the University of Pennsylvania. While at the University of Pennsylvania, Dr. Wiley was part of a team that developed a genetic test for protein-losing nephropathy in Soft-coated Wheaten terriers, a devastating kidney disease. After completing a small animal internal medicine residency at NC State, she has focused her studies on the diagnosis and treatment of lower urinary tract diseases. She is currently enrolled in a PhD program to evaluate the genetics of bladder and prostate cancer. Dr. Wiley has a strong interest in the veterinary applications of liquid biopsies.

Most of us have lost dogs to kidney disease, please join us for light snacks and an informative talk.

We are Organizing a 6 Minute Westie Walk at Kimberton Fire House at 12 noon on Friday, October 4th.

We have another pulmonary fibrosis (PF) research effort beginning at Tufts University and the University of Minnesota with Drs. Elizabeth Rozanski and Lindsey Merkel. The ***Westie Lung Disease*** Facebook group raised more than $30 thousand dollars to help this research move forward. For those owners of Westies over 7-8 years of age at Montgomery week this year, we will be hosting a 6 minute Westie Walk to determine how far the dogs can comfortably walk. This is an easy way to monitor the advancement of PF as their walk distance shortens. Westie owners at home can also participate and contribute to this work by following this link https://www.surveymonkey.com/r/SJSZGWK.

Getting to Know the Foundation Board

Randy Cantrell

WFA Director

My Westie experience began a full year before I became a Westie owner. My wife and I went to countless dog shows where we felt like fish at a dog show because we had no experience at such things. But we wanted to learn who the quality breeders were so we immersed ourselves in the Westie community. Tom Barrie, fellow board member, was one of the first people we met and he proved invaluable in advising us. Said Tom, "Get two. You'll be glad you did." Well, finding one was proving difficult enough, but Tom introduced us to the breeders in Houston raising Ashscot Westies. Dr. Kay McGuire, also a board member, was part of the ownership group. In March 2000 a litter was born and sometime later we were offered our heart's desire – a brother and sister, Rocky and Rosie. They remained a big part of our life until we lost Rocky around the age of 16 and Rosie followed him about a year later. A phone call to Dr. Kay informing her of their passing led to my volunteer work to help the Westie Foundation of America in whatever way I could.

Rocky & Rosie

I studied broadcast journalism at Louisiana State University, but devoted my career to running retail companies. I was fortunate to become a CEO when I was 25. I stepped away from the C-suite a few years ago to start a leadership training and coaching company serving mostly small business owners, CEOs, executives and leaders. Since the advent of the Internet I've also been heavily involved in new media: blogging, social media and podcasting. I'm devoted to helping the Westie Foundation of America because the promotion of Westie health is paramount to Westie owners and lovers worldwide. My wife and I live in the Dallas/Ft. Worth area and look forward to having Westies at our feet again.

In 2013 and 2014 the WFA asked for our members' support to bring to fruition a three-day workshop, *Fibrosis Across Species*, to convene animal and human researchers on the topic of Pulmonary Fibrosis. The workshop, held in Louisville, Kentucky, was hugely successful and has generated forward momentum and progress in the fibrosis field. WFA is honored to share the resulting academic paper that was recently published in ***The American Journal of the Medical Sciences***. WFA is grateful to donors, research participants and sponsors for supporting the WFA in this project.

Please note in the published document the WFA was mistakenly described as the official breed association of the West Highland White Terrier rather than as a nonprofit corporation recognized by the Internal Revenue Service as a 501 (c)(3) organization. The West Highland White Terrier Club of America has the distinction of being the official breed association. Also, Allison Platt designed the logo and website. We apologize that since the paper has already been published the lead authors cannot make changes.

REVIEW ARTICLE **Feature Issue: Update on Pulmonary Fibrosis**

Research in Pulmonary Fibrosis Across Species: Unleashing Discovery Through Comparative Biology

Teresa Barnes, BS[1], Kevin K. Brown, MD[2], Brendan Corcoran, MVD, DipPharm, PhD, MRCVS[3], Marilyn K. Glassberg, MD[4], Dolly J. Kervitsky, RCP[5], Andrew H. Limper, MD[6], Kay McGuire, DVM, MS[7], Kurt Williams, DVM, PhD[8] and Jesse Roman, MD[9], for the Comparative Biology of Pulmonary Fibrosis Group

[1] Independent Research and Patient Advocacy, Westie Foundation of America Board of Directors, formerly with the Coalition for Pulmonary Fibrosis, Culver City, California; [2] National Jewish Health, Denver, Colorado; [3] The Royal School of Veterinary Studies and the Roslin Institute, University of Edinburgh, Midlothian, UK; [4] University of Miami, Miller School of Medicine Miami, Florida; [5] PF Strategies, Golden, Colorado; [6] Mayo Clinic, Rochester, Minnesota; [7] Westie Foundation of America; [8] College of Veterinary Medicine, Michigan State University, East Lansing, Michigan; [9] Jane & Leonard Korman Respiratory Institute, Thomas Jefferson University, Philadelphia, Pennsylvania

Key Indexing Terms: Comparative biology; Lung fibrosis; Recommendations. [Am J Med Sci 2019;357(5):399–404.]

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Progressive scarring of the lung, also termed pulmonary fibrosis, has become the focus of many basic, translational and clinical investigations through out the world.To date, this research has revealed much needed information about the epidemiology and pathogenesis of pulmonary fibrosing disorders, with particular attention to idiopathic pulmonary fibrosis (IPF),the most common of the idiopathic interstitial pneumonias and the most devastating due to its poor prognosis.[1] However, despite many recent advances, only 2 so-called antifibrotic drugs are currently approved for the treatment of IPF; these drugs slow-down lung function decline, but do not improve the condition, and their role in other progressive fibrosing lung disorders remains unknown.[2] Thus, much research is still needed to gain further insights into the pathogenesis of these disorders, to identify reliable diagnostic and prognostic biomarkers, and to develop effective and safe interventions that improve survival. If successful, this research has the potential of positively affecting the natural course of related fibrosing disorders of the skin, kidney, heart, liver and other organs.

A major hindrance to progress in pulmonary fibrosis research is the lack of animal models capable of better resembling fibrosing lung disorders in humans and adequately predicting the efficacy of new interventions. Most animal models of pulmonary fibrosis available today require induction of lung injury by exogenous agents (e.g., bleomycin) and do not adequately model human disease, thereby raising questions about their utility in the quest for novel treatments.[3] Even if animal models were able to duplicate most of the characteristics of human disease, such as the usual interstitial pneumonia or UIP histologic pattern found in IPF, it would be difficult to duplicate the

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genetic and environmental factors that contribute to disease development in humans. This, compounded by the anatomic and behavior differences between animals and humans, has prevented the development of a truly relevant model.[4]

Interestingly, spontaneous progressive pulmonary fibrosis is not restricted to humans. In fact, this disorder has been recognized for over 2 decades in veterinary medicine in a variety of domestic animal species including cats, dogs and horses.[5, 6] Unfortunately, these disorders have received little attention in the biomedical community outside of veterinary medicine. Given that the affected species are long-lived animals that share a common environment with humans, they might represent relevant models of spontaneously occurring, progressive lung fibrosis. If so, investigating pulmonary fibrosis in these species could advance progress in this area.

Because of the potential of such approaches to accelerate discovery and to promote awareness, communication and collaboration regarding spontaneous progressive fibrosing lung disorders in mammals, the Westie Foundation of America (WFA) sponsored a 1-day meeting in October 2007 held in Lafayette, Indiana, USA. The WFA is the official breed association of the West Highland Terrier, a breed of dogs that is known to be afflicted with progressive lung fibrosis. This workshop brought together international physicians, veterinarians, pathologists, researchers and advocacy experts to discuss fibrotic lung disorders in humans and domestic animals. Afterward, a working group of the American Thoracic Society and participants of the initial workshop reported on the workshop findings and made the following recommendations[7]: (1) Promote the conduction of detailed descriptive studies in affected domestic animals to define the clinical, imaging and pathologic presentation of pulmonary fibrosis in these species; (2) Emphasize the need for performing genetic studies and other pathogenesis-based investigations in naturally-occurring spontaneous models of pulmonary fibrosis to investigate the potential translation to IPF in humans as these models should provide more relevant tools to investigate the potential effectiveness of novel antifibrosis drugs in prehuman trials; (3) Emphasize the need for studies defining the anatomic and cellular differences in the lungs of different species for the adequate interpretation of discordant findings; (4) Stimulate the generation of suitable reagents to adequately test hypotheses in different species of animals; and (5) Promote the establishment of a consortium of interested centers and a central repository of clinical information and biologic specimens from naturally occurring spontaneous models of lung fibrosis in domestic animals to enable further research that may benefit both physicians and veterinarians in their efforts to adequately manage lung fibrosis in their patient populations.

In May 2014, a second meeting on Comparative Biology of Pulmonary Fibrosis was held in Louisville, Kentucky. As before, clinicians, researchers, veterinary doctors, pathologists and patient advocates came together to discuss the state of research in this field.The meeting was again endorsed by members of the Working Group on Lung Fibrosis of the Assembly of Respiratory Cell and Molecular Biology of the American Thoracic Society, and

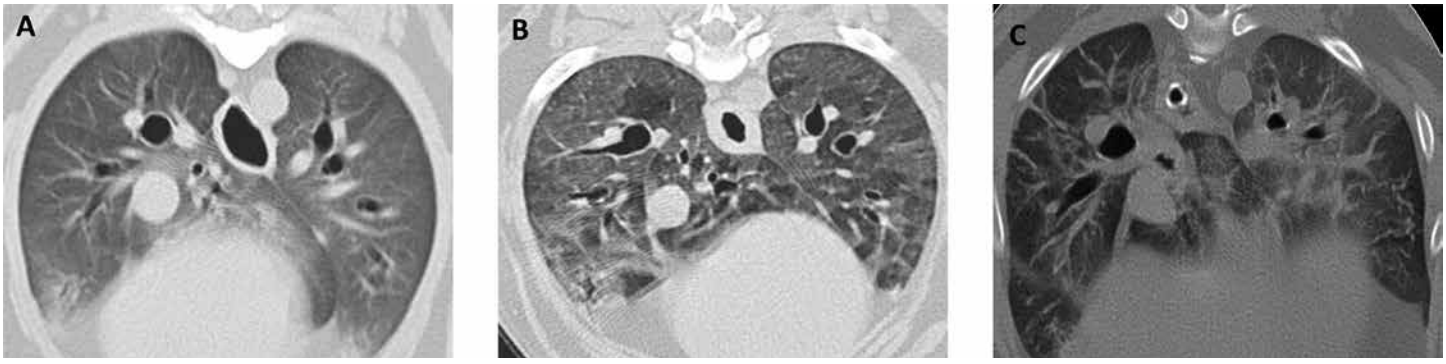

FIGURE 1. Computed tomography scan image of dog with pulmonary fibrosis. (A) Ground glass opacity in mildly affected dog. (B) Extensive ground glass opacity with prominent mosaic attenuation in moderately affected dog. (C) Ground glass opacity, traction bronchiectasis and parenchymal bands in severely affected dog.

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was supported by industry, The Westie Foundation, The Morris Animal Foundation and The AKC Canine Health Foundation. During the meeting, extensive discussions surrounded the limited progress made in the field since the first meeting. However, energized by the potential this field of investigation could have on understanding fibrosing lung disorders, the team powered through an ambitious agenda hoping to define a new path for such efforts. The proceedings of this meeting were not published; however, considering the perceived importance of the discussions held, a group of meeting organizers and participants came together to summarize its proceedings in this document.

The group discussion first focused on the fact that key clinical manifestations of pulmonary fibrosis are common in both humans and domestic animals. These similarities are best highlighted in recent publications showing that in canine IPF, for example, the disease is a chronic, progressive, interstitial lung disease affecting mainly middle-aged and old West Highland white terriers.[8] It is clinically characterized by exercise intolerance, restrictive dyspnea and coughing, and course crackles are present on lung auscultation. Abnormal blood gases and shortened "6-minute walk test" distance, a test that evaluates endurance and gas exchange capability, are common, and secondary pulmonary hypertension is not infrequent.[9] These data emphasize the striking similarities in the clinical presentation of spontaneously occurring pulmonary fibrosis observed in humans and domestic animals as highlighted previously.[7]

More data about the imaging presentation of pulmonary fibrosis in domestic animals have also emerged *(see Figure 1)*. In a retrospective study including 21 West Highland white terriers (WHWT), the severity of pulmonary computer tomography (CT) findings was positively correlated with severity of clinical signs, and negatively associated with survival time after diagnosis. The most common CT findings included ground glass pattern (16/21dogs) and focal reticular and mosaic ground-glass opacities (10/21dogs), with very rare and minimal honey- combing identified.[10]

In addition to the above, the group also discussed that noted similarities between dogs and humans began to dissipate when evaluating the pulmonary histopathologic findings present in these conditions. In 18 WHWT with canine IPF, a pattern resembling NSIP was predominant rather than a pattern of UIP.[11] NSIP, for non specific interstitial pneumonia, is another histologic pattern observed in another type of idiopathic interstitial pneumonia. In contrast to UIP, the NSIP pattern is more homogenous throughout the lung, shows more cellularity and less fibrosis, and fibroblastic foci are not typical; this entity is considered responsive to immunosuppression in many circumstances in humans.[12] The majority of the dogs tested showed multifocal areas of accentuated subpleural and peribronchiolar fibrosis with what was reported as occasional honeycombing and "profound" alveolar epithelial changes, and fibroblastic foci were not seen. In some cases, intra-alveolar organizing fibrosis adjacent to interstitial mature collagen deposition was observed, especially in more severely affected areas. Interestingly, severe pulmonary lesions were more frequent in the caudal than in the cranial lung lobes. The increased availability of high-resolution computed tomography data from affected dogs, coupled with the limited pathologic data already available, support the contention that the canine form of IPF is in fact NSIP. Case cohort studies are now ongoing at the University of Edinburgh Veterinary School to assess the clinical response of affected dogs to immuno-suppressive therapy with prednisolone and mycophenolate to determine if this indeed behaves as NSIP. Furthermore, while the ground glass attenuation and mosaic pattern on HRTC can be associated with hypersensitivity pneumonitis, this condition can be excluded as it is not recognized in the dog. One confounding factor, however, is the often-late presentation of affected dogs with extensive fibrosis making measurable response to trial therapy problematic.

In evaluating 9 cats carrying a diagnosis of pulmonary fibrosis based on radiographic findings, investigators found focally increased soft tissue attenuation, masses and ventral consolidations that exhibited no improvement with dorsal vs. ventral recumbence.[13] On histology, pulmonary fibrosis in these cats was evident with type II pneumocyte hyperplasia and smooth muscle hypertrophy. Epithelial metaplasia was present in one case. However, they also observed changes consistent with a broncho-interstitial pattern, alveolar pattern, pulmonary masses, pulmonary bullae, pleural effusions and cardiomegaly. Overall, the findings suggested highly variable radiographic characteristics, which might mimic pulmonary fibrosis, but also other conditions such as asthma, pneumonia, pulmonary edema and neoplasia.

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In another study, 23 cats with a histology of UIP were investigated.[14] Most were middle-aged to older cats (median 8.7 years) with no obvious sex or breed predisposition. Symptoms included respiratory distress and cough. Duration of signs was less than 6 months in 17 cats. Exam revealed tachypnea, inspiratory or mixed inspiratory and expiratory effort, and adventitial lung sounds. Radiographic changes included dense patchy or diffuse interstitial, bronchiolar, and alveolar infiltrates. BALF revealed mild neutrophilic inflammation in 6 cases, with no consistent pathogen identified. Response to steroids is poor and most cats died within days to months.

Horses also develop pulmonary fibrosis, known as equine multinodular pulmonary fibrosis or EMPF because of its characteristic imaging and histologic patterns that are distinct from UIP in the setting of IPF in humans. Emerging data point to the equine gamma Herpes Virus 5 as the cause of EMPF as investigators have been able to experimentally reproduce EMPF in horses inoculated with EHV5 isolated from cases of EMPF.[15,16]

Overall, the group remained impressed with the similarities observed in symptoms, lung examination, abnormalities in oxygenation and imaging studies, and outcomes when comparing humans and domestic animals with pulmonary fibrosis. However, the differences observed in histopathology strongly argue against these being identical conditions. This prompted discussions regarding mechanisms of action and several presentations were devoted to this topic. To date, there is consensus that IPF and other forms of fibrosing lung disease are likely triggered by certain exposures in the setting of host genetics that render the lung epithelium susceptible to injury. In turn, epithelial cell injury leads to its dysfunction and the subsequent elicitation of intracellular pathways responsible for the over expression of soluble profibrotic growth factors. Of these, transforming growth factor-b (TGFb) is considered the most influential, but many other activated signals exert profibrotic activity. The above results in the proliferation of fibroblasts and the excessive expression and deposition of fibronectin, collagens, and other extracellular matrices that ultimately destroy the delicate architecture of the lung and its gas exchanging units.[17] New data regarding the potential role of oxidative stress, dysregulated miRNAs, epigenetics, telomere shortening, tissue stiffness, aberrant metabolism, altered immunity, and aging have further added depth to our understanding of mechanisms of disease, but it is too early to determine if this new knowledge will lead to clinical tools capable of affecting patient outcomes.[18]

Similar mechanisms are likely present in canine IPF as TGFb protein was detected by immunohistochemistry in areas of fibrosis, and a receptor for TGFb, TFGbRI and a transcription factor known for promoting its intracellular effects, pSMAD2/3, were found in the epithelium.[19] Interestingly, latent binding TGFb protein gene expression was decreased as was b8 integrin; these changes have been proposed to ultimately affect TGFb activation. Another extracellular matrix implicated in pulmonary fibrosis, thrombospondin-1, also appeared upregulated. Of note, circulating TGFb1 concentrations in the periphery were higher in animals "predisposed" to pulmonary fibrosis compared to "nonpredisposed" breeds.[20] Alveolar interstitial fibrillin-2 immunoreactivity was upregulated in WHWTS as well. This is similar to what has been found the idiopathic interstitial pneumonias in humans.

Chemokines have also been implicated in the pathogenesis of IPF. Similarly, higher levels of CCL2 and CXCL8 have been detected in bronchoalveolar lavage fluid obtained from affected WHWTs compared to healthy dogs.[21] Circulating levels of CCL2, but not CXCL8, were reported in the same animals. In contrast, no differences in relative gene expression for CCL2, CXCL8, CCR2 or CXCR2 were observed when comparing the lung biopsies of control vs. affected animals. In those affected, CCL2 and CXCL8 immunoreactivity was detected in bronchial airway epithelial cells. In other work, ActivinB, a cytokine member of the TGFb super-family, was found to be upregulated in the bronchoalveolar lavage fluid of WHWTs with canine IPF, but not Activin A.[22] These studies suggest that similar mechanisms of action are acting in both human and animal forms of spontaneous pulmonary fibrosis, but they fail to explain how such pathways lead to distinct histologic patterns observed between species.

Conclusions, Challenges and Recommendations

Overall, the discussions of the 2014 meeting emphasized a concept unveiled during the earlier meeting. Namely, that domestic animals develop spontaneously occurring interstitial lung diseases that can result in pulmonary fibrosis and share features with the human condition. While prior discussions centered on the possibility that some of these animals may develop disease identical to the

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FIGURE 2. Meeting participants.

human condition, the more recent histopathologic studies available suggest that domestic animals develop diseases with clinical manifestations similar to those of human IPF, but are likely distinct from that condition. Nevertheless, the group felt that, while identifying a model identical to the human condition would be preferable, a more realistic goal would be to simply identify better models of spontaneously occurring disease than those currently used today; domestic animals such as the WHWT might provide such a model.

Two important challenges hindering progress in this area remain present today. The first relates to difficulties inherent in communicating about these disorders considering that domestic animals with pulmonary fibrosis are simply referred to has having IPF (e.g., canine IPF), which is confusing as these animals do not appear to adequately mimic human IPF. The group recommends that the term "idiopathic interstitial pneumonia or IIP" be used as this reflects classifications used in human disease. For example, instead of canine IPF, the term canine IIP should be used, at least until these IIPs are better defined.

The above challenge is directly linked to gaps in disease definition due to an inadequate understanding of the clinical, histologic and radiographic manifestations of pulmonary fibrosis in distinct animal species. Greater understanding of IPF and related idiopathic interstitial pneumonias in humans came after defining their distinct clinical, radiographic, and histologic presentations. In fact, today, an accurate diagnosis of these human conditions remains dependent on the interpretation of the aggregate clinical, radiographic and histologic data. This knowledge laid the foundation for the emergence of standardized, placebo-controlled, and randomized clinical trials that culminated in the identification of anti-fibrotic drugs. Unfortunately, this information is not available for domestic animals. To date, studies correlating the clinical, radiographic and histologic presentations of domestic animals with fibrosing lung disease are very limited, and a clear classification of these disorders and diagnostic algorithms remain to be developed. Success in collecting such data would be greatly accelerated by the establishment of domestic animal clinical registries well linked to tissue and other biological sample repositories. Such repositories may be located at specialized veterinary centers with interest and expertise in this field. Undoubtedly, the resources needed to support such endeavor are significant and may originate in industry, private foundations and government agencies.

In short, domestic animals develop spontaneously occurring fibrosing lung disease that resembles the human condition. Although not identical, these models might be superior to those used today when testing mechanisms of action and the effectiveness of novel interventions. However, this will first require a better classification of fibrosing lung disorders in domestic animals based on clinical, radiographic and histologic presentations. Obtaining the information needed to develop such classification would benefit from a registry of clinical data and biological samples. The molecular tools needed to test genetic variants and mechanisms of action and to unveil potential targets for intervention are available, but this will require access to well-defined biological specimens from nonhuman disease. The above effort will likely require support from industry, private foundations and

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government agencies. Considering the burden of fibrosing lung disorders to both humans and domestic animals, such investment is considered worthy.

Meeting Participants *(SEE FIGURE 2)*

Teresa Barnes Tosi, formerly of Coalition of Pulmonary Fibrosis, The Westie Foundation; Peter Bitterman, University of Minnesota; Kevin K. Brown, National Jewish Health; Tim Capps, University of Louisville; Stephan Carey, Michigan State; Mike Chaddock, Texas and A&M University; Cecile Clercx, University of Liege; Alan Cohen, EddingPharm; Brendan Corcoran, University of Edinburgh; Joao deAndrade, University of Alabama-Birmingham; Jason DeVoss, Genentech; Dennis E. Doherty, University of Kentucky; Steven Dow, Colorado State University; Kari Ekenstedt, University of Wisconsin; Valerie Fadok; Mostafa M. Fraig, University of Louisville; Marilyn Glassberg, University of Miami; Allyn Harris, University of Mississippi; Ann Marie Hollowathy, The Westie Foundation; Susan Johnson Rowland, Harvey Oaks Animal Hospital; Robert Kaner, Cornell University; Paula Katavolos, Genentech; Anne Keane, Genentech/ Roche; Caroline Keane; Roche Welwyn, United Kingdom; Dolly Kervitsky, Pulmonary Fibrosis Foundation; Wayne Kompare, The Westie Foundation of America; Liisa Lilja-Maula, University of Helsinki; Andrew Limper, Mayo Clinic; Mahmoud Loghman-Adham, Baxter Healthcare; David Lynch, National Jewish Health; Clay Marsh, Ohio State University; Kay McGuire, The Westie Foundation; Ana Mora, University of Pittsburgh; Imre Noth, University of Chicago; Mitchell Olman, Cleveland Clinic; Amy Olson, National Jewish Health; Patricia Olson, Seattle, WA; Greg Cosgrove, National Jewish Health; Matt Huentelman, Tgen; David Schwartz, University of Colorado; Bebe Pinter, WFA; Andrew Tager, Massachusetts General Hospital; William Kurt, Michigan State; John Tosi, New York; Rick Vulliet, UC Davis; Mark Neff, Van Andel Institute; Carol Reinero, University of Missouri; Mauricio Rojas, University of Pittsburg; Chand Khanna, NIH; Elizabeth Rozanski, Tufts University; Elaine Ostrander, NIH; Rafael Perez, University of Louisville; Tamra Perez, University of Louisville, and Jesse Roman, University of Louisville.

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Conflict of Interest Statement

The symposium was sponsored by the Working Group on Lung Fibrosis of the Assembly of Respiratory Cell and Molecular Biology of the American Thoracic Society, and was supported by industry, The Westie Foundation, The Morris Animal Foundation, and The AKC Canine Health Foundation, among others. Symposium sponsors had no input in the development of the symposium content, selection of speakers or in the development of this manuscript. T.R.B. reports non-financial support from American Thoracic Society, personal fees from Coalition for Pulmonary Fibrosis, membership on board of directors for Westie Foundation of America and science board for New Amsterdam Sciences. K.K.B reports the following outside the submitted work, grants from NHLBI, personal fees from Biogen, Galecto, MedImmune, Roche/Genentech, ProMetic, Patara, Third Pole, Galapagos, Boehringer Ingelheim, Theravance,Three Lakes Partners and Veracyte. He has served on the Boards of the Pulmonary Fibrosis Foundation and the American Thoracic Society. B.C. reports grant support from the American Kennel Club and Westie Foundation of North America to support canine IPF research, and outside the submitted work from Zoetis Animal Health (USA), the Dogs Trust (UK) and the Roslin Institute (UK). M.K.G. has served as site PI or on the steering committee in industry-sponsored clinical trials (Actelion, Bellerophon, Boehringer Ingelheim, Celgene, Galapagos, Genentech/Roche, Gilead, InterMune, Stromedix and Toray) and has been funded by the National Institutes of Health, Genentech, and several private research foundations. She serves on the National Scientific Advisory Committee of the American Lung Association and has served as chair of the Women and Pulmonary group of the American College of Chest Physicians. D.J.K. reports personal fees from Boehringer- Ingelheim, outside the

(Continued on page 11)

(Research in Pulmonary Fibrosis continued from page 10)

submitted work; and was formerly Vice President of Patient Relations and Medical Affairs at the Pulmonary Fibrosis Foundation. A.H.L. has served as site PI or collaborator on industry-sponsored clinical trials (Roche-Genentech, Boehringer Ingelheim) and has been funded by the National Institutes of Health and The Hurvis and Brewer Foundations. He has served on the Boards of the Pulmonary Fibrosis Foundation. K.W. has received research funding through the AKC Canine Health Foundation for a separate project. J.R. has served as site PI or collaborator in industry-sponsored clinical trials (Gilead, InterMune, ImmuneWorks, Boehringer Ingelheim, Bristol Myers Squibb) and is funded by the National Institutes of Health and the Department of Veterans Affairs. He served on the Boards of the Pulmonary Fibrosis Foundation and the American Lung Association-Midland States.

References

1. Lederer DJ, Martinez FJ. Idiopathic pulmonary fibrosis. N Engl J Med. 2018; 378: 1811–1823.
2. Aryal S, NathanSD.An update on emerging drugs for the treatment of idiopathic pulmonary fibrosis.Expert Opin Emerg Drugs. 2018; 23: 159–172.
3. Tashiro J, Rubio GA, Limper AH, et al. Exploring animal models that resemble idiopathic pulmonary fibrosis. Front Med. 2017; 4:118. https://doi.org/10.3389/fmed. 2017. 00118.
4. Williams K, Roman J. Studying human respiratory disease in animals – role of induced and naturally occurring models. J Pathol. 2016; 238: 220–232.
5. Corcoran BM, Cobb M, Martin WW, et al. Chronic pulmonary disease in West Highland white terriers. Vet Rec. 1999; 144: 611–616.
6. Williams KJ, Malarkey D, Cohn L, et al. Identification of spontaneous feline idiopathic pulmonary fibrosis: morphology and ultrastructural evidence of a type II pneumocyte defect. Chest. 2004; 125: 2278–2288.
7. Roman J, Brown KK, Olson A, et al. Comparative pathobiology of fibrosing lung disorders in humans and domestic animals. AnnAmThorac Soc. 10: S224-S229.
8. Hikkila-Laurila HP, Rajamaki MM. Idiopathic pulmonary fibrosis in West Highland white terriers. Vet Clin North Am Small Anim Pract. 2014; 44: 129–142.
9. Clercx C, Fastres A, Roels E. Idiopathic pulmonary fibrosis in West Highland white terriers: an update.Vet J. 2018; 242: 53–58.
10. Thierry F, Handel I, Hammond G, et al. Further characterization of computed tomographic and clinical features for staging and prognosis of idiopathic pulmonary fibrosis in West Highland white terriers. Vet Radiol Ultrasound. 2017; 58: 381–388.
11. Syrja P, Hikkila HP, Lillia-Maula L, et al. The histopathology of idiopathic pulmonary fibrosis in West Highland white terriers shares features of both non-specific interstitial pneumonia and usual interstitial pneumonia in man. J Comp Pathol. 2013; 149: 303–313.
12. Wells AU, Cottin V. Nonspecific interstitial pneumonia: time to be more specific? Curr Opin Pulm Med. 2016; 22: 450–455.
13. Evola MG, Edmondson EF, Raichle JK, et al. Radiographic and histopathologic characteristics of pulmonary fibrosis in nine cats. Vet Radiol Ultrasound. 2014; 55: 133–140.
14. Cohn LA, Norris CR, Hawkins EC, et al. Identification and characterization of an idiopathic pulmonary fibrosis-like condition in cats. J Vet Intern Med. 2004; 18: 632–641.
15. Williams KJ. Gamma herpes viruses and pulmonary fibrosis: evidence from humans, horses, and rodents. Vet Pathol. 2014; 51: 372–384.
16. Williams KJ, Robinson NE, Lim A, et al. Experimental induction of pulmonary fibros is in horses with the gamma herpes virus equine herpes virus 5. PLoS One. 2013; 8(10): e77754.
17. Upagupta C, Shimbori C, Alsilmi R, et al. Matrix abnormalities in pulmonaryfibrosis.Eur Respir Rev. 2018; 27(18). pii: 180033. https://doi.org/10.1183/ 16000617.0033-2018.
18. Selman M, Lopez-Otin C, Pardo A. Age-driven developmental drift in the pathogenesis of idiopathic pulmonary fibrosis. Eur Respir J. 2016; 48: 538–552.
19. Krafft E, Lybaert P, Roels E, et al. Transforming growth factor beta 1 activation, storage, and signaling pathway in idiopathic pulmonary fibrosis in dogs. J Vet Intern Med. 2014; 28: 1666–1675.
20. Lilia-Maula L, Syria P, Laurila HP, et al. Comparative study of transforming growth factor-b signaling and regulatory molecules in human and canine idiopathic pulmonary fibrosis. J Comp Pathol. 2014; 150: 399–407.
21. Roels E, Krafft E, Farnir F, et al. Assessment of CCL2 and CXCL8 chemokines in serum, bronchoalveolar lavage fluid and lung tissue samples from dogs affected with canine idiopathic pulmonary fibrosis. Vet J. 2015; 206: 75–82.
22. Lilia-Maula L, Syrja P, Laurila HP, et al. Upregulation of alveolar levels of activin B, but not activin A, in lungs of West Highland white terriers with idiopathic pulmonary fibrosis and diffuse alveolar damage.J Comp Pathol. 2015; 152: 192–200.

Submitted February 10, 2019; accepted February 10, 2019.
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www.amjmedsci.com www.ssciweb.org

WFA-Funded Study Makes Unexpected Findings in Disease Affecting 10 Percent of Canine Breeds

Cornell Atopic Study May Help Improve Diagnosis, Treatment of Westies with Atopic Dermatitis, At-Risk Westies, Other Breeds

By Teresa Barnes, Vice President Communication

Intro

The WFA is pleased to announce the results of an important Atopic Dermatitis study that was made possible because of support from the Westie owner and breeder community and the generous support of the WFA's donors, including the New Zealand West Highland Terrier Club that provided funding for 50 percent of the grant.

Study Purpose

In 2018, the WFA granted $20,000 to Cornell University immunology researcher, Elia Tait Wojno, PhD, for an investigation exploring a potential genetic link to atopic dermatitis in Westies.

Summary of Findings

Healthy Westies with no signs of allergies had relatively high readings for Th2 cells (cells that are associated with allergy and that persist, "remembering" the allergen and reacting over and over). This is in contrast to healthy dogs of other breeds. We don't know what this means, though it could suggest that Westies have more pro-allergic cells to begin with. Allergic dogs had a different gene signature, specifically in the T cell compartment that was enriched for expression of Gata3 (pro-allergic protein.)

Dr. Tait Wojno and her team performed genetic analysis and found that allergic dogs with Atopic Dermatitis (AD) had a different gene signature [a rule that predicts health outcomes] than healthy dogs. The results of the study may help improve diagnosis and treatment of AD in Westies and in Westies with allergic symptoms but do not yet have AD.

According to the AKC Canine Health Foundation, 10 percent of dogs are affected by AD which is the second most common allergy in dogs behind flea bite allergy.

"The genetic analysis was really exciting," said Dr. Wojno. "We observed that allergic dogs had a different gene signature, specifically in the T cell compartment that was enriched for expression of Gata3. These results were completely unbiased… So it was quite striking that Gata3 came out of this analysis."

Based on previous research in other breeds, the researchers had anticipated a cell called Th2 would be elevated in the Westies with allergies. They found that Th2 cells weren't actually elevated in AD Westies when compared with healthy Westies. What they did find is that Gata3 was. Another unexpected finding was that the Th2 cells were increased in Westies with no signs of allergies.

Background

WFA wrote in our Summer 2018 issue of this newsletter that this research project could be pivotal in predicting a puppy's future allergic response which would allow breeders to make more informed decisions with dogs at an early age.

Specifically, the goal for Dr. Wojna's research project was to identify an immune cell profile of a AD Westie and how it differs from a healthy Westie. She expected that she and her team would be able to identify a profile in the dog that doesn't yet show signs of allergies and would then move to test the idea of a biomarker which would be helpful in determining response to therapy in future studies. Previous work by Dr. Wojna's lab showed dogs with severe AD that were seen at Cornell had unique immune signatures in their blood. The particular cells (Th2 cells) were associated with "remembering" an allergen and repeatedly reacting to it and the cells were increased in atopic dogs compared to healthy dogs.

(Continued on page 13)

(WFA-Funded Study continued from page 12)

So, Dr. Wojna and her team hypothesized that something similar could be affecting Westies with AD, as well. However, their results of the study did not show that there was a significant increase in the Th2 cells in atopic vs. healthy Westies. However, researchers made an interesting finding that there was an increase in Gata3 (a pro-allergic protein associated with Th2 cells) in Westies who were designated as healthy but showed signs of allergy. They also found something else of interest – that Westies with no signs of allergies had relatively high readings of Th2 cells – in contrast to healthy dogs in other breeds. Dr. Wojna believes this finding could be important because it may suggest that Westies may have pro-allergic cells to begin with (naturally).

"Having a way to measure if therapy is successful early on could be important," she said. The work in the study, Dr. Wojna believes, could help lead to better diagnostic tools. Though readily diagnosed by doctors who treat Westies, atopic dermatitis in the general veterinary practice, she says, may be less familiar and making such a diagnosis in a first visit can be complicated. She says looking to see if an immune cell profile in the blood could be used as a diagnostic factor, thereby improving the accuracy and speed of making the diagnosis.

Dr. Wojna says working with Westies adds an important element to her work in allergic disease in canines. "These dogs are allergic and it gives us an opportunity that we can work with a group of pedigreed dogs, can look at genetic information on the dogs and can look at immune profiles in a single breed--looking at the gene and environment interaction."

How This Research May Help Westies

Kay McGuire, DVM, MS Vice President of Health for the WFA said "How exciting it is to actually find unexpected changes at the cellular level. As Dr. Wojno's work progresses, it would be wonderful if we had a simple test to predict allergic dogs as puppies. We could then select away from the problem when breeding."

Westie Foundation of America Awards Second Veterinary Scholarship

The Westie Foundation of America, Inc. is pleased to announce the recipient of the 2019 Daphne Gentry Veterinary Scholarship. Chelsea A. Iennarella-Servantez, MS received a $5,000 scholarship to support her educational endeavors seeking two doctorates.

In her application, Iennarella-Servantez said, "Past experiences have taught me ways in which animals have a positive impact on human life; whether in unconditional love given by pets or the sacrifice research animals make so those affected by debilitating disease might live. I learned then that my life's work would involve strengthening this bond."

She is dual-enrolled as a doctoral candidate in of Veterinary Medicine (DVM) and Philosophy (PhD) specifically in immunobiology programs at Iowa State University. She explains her PhD program focuses on pathogenesis and treatment of chronic gastrointestinal (GI) diseases in dogs including Inflammatory Bowel Disease (IBD) as well as other chronic inflammatory disorders. "We are excited to have a professional of Chelsea's caliber dedicating her career to addressing the pathogenesis of this disease that affects our Westies. IBD and other such disorders are common in the Westie breed," said Kay McGuire, DVM, MS, Vice President Health of the WFA.

Currently holding a Master of Science degree in Animal Science, Iennarella-Servantez plans to pursue a residency to become a board-certified nutritionist after graduation. The WFA will follow her career and update our members as she reaches her goals.

WFA's Daphne Gentry Veterinary Scholarship Winner's First Year

By Dr. Chie Tamamoto-Mochizuki

Atopic dermatitis is one of the most common diseases in dogs. Because of the constant discomfort and irritation, affected dogs often experience a very poor quality of life. Unfortunately, Westies are reported to be one of the common breeds for developing atopic dermatitis. Although more and more treatment options have become available in veterinary medicine for the last 20 years, there are still certain numbers of patients who do not respond to the current standard therapy. Therefore, there is still an insistent demand for a new, more effective treatments to save these patients as well as their owners who want to give them more comfortable lives. The studies on disease mechanism are very critical since they will become great clues to develop a new treatment.

Thanks to the support of my sponsors, North Carolina State University and the Westie Foundation of America, I was able to conduct the first study of my PhD course last year. It was a fundamental study to obtain a better understanding of IL-31, one of the newly-found cytokines that is one of the key drivers of itch in canine atopic dermatitis. This study will lead to my second step, a study aiming to find a new, more effective therapeutic target for canine atopic dermatitis to help more atopic patients. Other than this main research for my Ph.D. program, a pilot study to generate a new model of canine atopic dermatitis was performed as one of the sub-studies. This will facilitate the studies in canine atopic dermatitis in the future to uncover its pathomechanisms and to test the new treatments for canine atopic dermatitis in the future.

During the last year, I also passed the board examination of Asian College of Veterinary Dermatology and became an 11th board-certified veterinary dermatologist in Asia. Westies are popular also in Asian countries, and they are suffering from atopic dermatitis as in the USA. Since the number of veterinary dermatologists is limited in Asia, many atopic dogs are not under the best, latest, evidence-based care. As a board-certified veterinary dermatologist, I will have more chance to educate veterinarians in Asia to help them and their atopic patients.

Update on My Research

- **The main studies of my Ph.D. program:**

  The first study, IL-31/IL-31 receptor in canine atopic dermatitis, was performed and is currently under the analyses.

  The second study, the effect of Cytopoint (lokivetmab: anti-IL-31 antibody) in canine atopic dermatitis, is scheduled this fall.

- **The sub-studies:**

  A study of Cytopoint® in the prevention of canine atopic dermatitis was performed.

  A pilot study of generating a new canine atopic model was performed.

Publications

- ***Jan 2019***

  Tamamoto-Mochizuki C, Paps JS and Olivry T. Proactive maintenance therapy of canine atopic dermatitis with the anti-IL-31 lokivetmab. Can a monoclonal antibody blocking a single cytokine prevent allergy flares? *Vet Dermatol* 2019; 30: 98-e26.

Congress Attendance

- North American Veterinary Dermatology Forum (NAVDF), April 2019.

Others

- Passed the board examination of Asian College of Veterinary Dermatology (AiCVD), July 2018 – became the 11th Veterinary Dermatologist in Asia.

The Use of WFA Funding

- Upgrading Dropbox to have a better environment for research data management.
- Application & registration of AiCVD diplomate.
- Will be used to attend Asian Veterinary Dermatology Congress in Shanghai, China, Oct 2019.

Could Grain-Free Diets Damage My Dog's Heart?

The U.S. Food and Drug Administration is following reports of dogs with a heart condition that may be tied to certain pet foods containing peas, lentils, other legume seeds or potatoes as main ingredients.

Reprinted with permission dvm360

Certain Diets May Be Tied To Cases Of Heart Problems In Dogs

In July 2018, the U.S. Food and Drug Administration (FDA) alerted pet owners and veterinarians of reports that some dogs eating certain pet food with peas, lentils, other legume seeds or potatoes were diagnosed with dilated cardiomyopathy (DCM). Those ingredients seem to be common in some "grain-free" diets, but diets containing grains were also represented in the reports. A small number of cases reported involved dogs who ate a home-cooked diet.

What's Canine Dilated Cardiomyopathy

In DCM, a dog's heart muscle thins and the heart chambers enlarge, so the heart has a harder time pumping and heart valves may leak. These changes can lead to fluid buildup in the dog's lungs and abdomen. If your dog ever shows signs of DCM or other heart conditions, including decreased energy, cough, difficulty breathing or episodes of collapse, contact your veterinarian.

What's Being Done?

The FDA is working with laboratories, veterinarians, animal nutritionists and other scientists as well as pet food manufacturers to better understand the cases and potential ties to diet.

What Should I Do?

If you want to know whether your pet's food is one of the diets being discussed, review the ingredient list to see whether legumes and/or potatoes are listed as main ingredients (which typically show up before the first vitamin or mineral ingredient).

The FDA was not advising dietary changes as of February 2019, but you can discuss that with your veterinarian, taking into account your dog's specific needs and medical history.

The FDA has also asked pet owners and veterinary professionals to report cases of DCM in dogs that are suspected of having a link to the dog's diet.

Where Do I Find The Most Up-To-Date Information?

> Ask your veterinarian.
> Read all the official information from the FDA at **fda.gov**.

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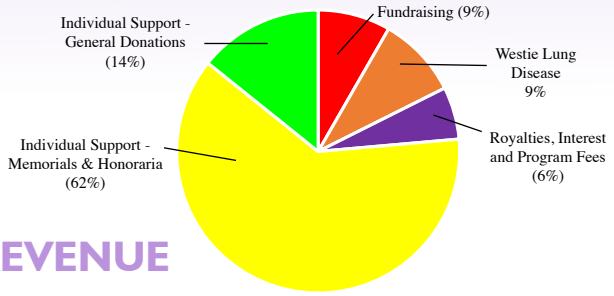
Source: The U.S. Food and Drug Administration

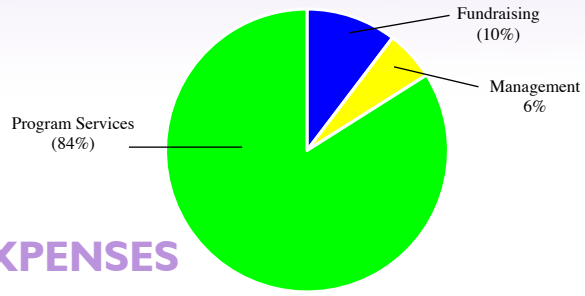
Financial Report - Fiscal Year 2018

By Gary C. Sackett, Treasurer

Revenue = $238,097



Expenses = $48,767



REVENUE

Individual Support Revenue from individuals supporting the Westie Foundation of America, Inc's (WFA) mission in 2018 totaled $181,898 (77%), including a bequest of $127,000 from a long-time supporter. An additional $14,277 in royalties from Affiliate programs, Interest and *Westie Healthbook* sales (6%), $19,774 from fundraising efforts including the Facebook and Montgomery County auctions (8%) and $22,148 (9%) earmarked for a specific IPF study from a grass roots group of Westie owners.

ASSETS

Endowment Funds All memorials and honoraria are added to the Donor Restricted Endowment Fund which now totals $349,556. Through the legacies of Nancy Schoch and Daphne Gentry, we have significant funds dedicated to Pulmonary Fibrosis research and a veterinary scholarship, awarded for the first time in 2018. Our Donor Restricted Endowment Fund totals 47% of our assets. The income from these funds may be used to fund projects, but the principal is restricted by the Board of Directors and invested carefully to maintain principal while bringing a reasonable return. Our endowment fund grew by 6.4%, including donations/credits of $56,700, partially offset by market decline and payment of related grants and a scholarship. These are tracked monthly to ensure conformance with WFA investment policy.

Unrestricted Funds Funds WFA has an unrestricted fund balance of $393,981 including cash, CDs and Mutual Fund investments. This is used to fund management operations, fundraising and program services.

LIABILITIES

Future Projects WFA retains liabilities of $18,000 to fund a planned Cancer connection workshop, publishing results of the 2014 workshop and $716 in Accounts Payable.

EXPENSES

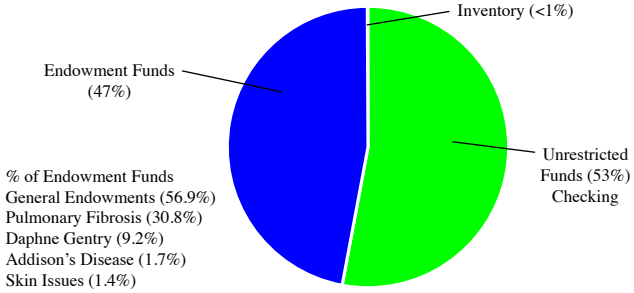
Program Services In 2018, WFA continued support of research and education related to diseases affecting the West Highland White Terrier and held health seminars at the Roving and National Specialties weekend.

Research Funds spent on research were almost all matched by funds from the AKC Canine Health Foundation and Morris Animal Foundation, compounding the benefits our Westies will receive. Grants addressed further Investigation into Atopic Dermatitis ($9,000), Capturing Tumor Cells in Blood ($3000), 2 grants related to B-cell Lymphoma prognosis and treatment ($3,000 each), and a grant to Cornell University for Atopic Dermatitis Research ($12,858). In addition, the WFA awarded its first ever veterinary scholarship in the amount of $5000. In addition, over $22,000 has been raised as part of a needed $32,000 for a IPF drug study to be awarded in 2019 and lead by researchers at Tufts University.

Education Expenses included our website ($439), the outstanding ***Westie Wellness*** ($4,793), and our sponsored seminars ($338).

Management and Fundraising These expenses were kept to a minimum (16% in 2018 vs 20.3% in 2017) by careful allocation of resources and the fact that all officers, directors, and committee members are unpaid volunteers.

Assets = $744,136



NOTE: IRS Form 990 (Return of Organization Exempt From Income Tax) is available on line at our Web Site, www.WestieFoundation.org/about.htm , under "Public Disclosure".

Westie Owners Triumph, Raise Funds for Innovative PF Study

By Teresa Barnes

Tyler

PJ Kessler and Westie owners whose dogs suffer from Pulmonary Fibrosis have made history. They successfully raised funds for the first-of-its kind drug study in Westies with Pulmonary Fibrosis (PF).

Background

When PJ Kessler heard about an innovative approach the WFA was taking to solving the deadly lung disease that afflicted her Westie, Tyler, and claimed the life of another of her Westie pets, she took action. She quickly created a GoFundMe page and months later, had raised the funds needed for the study (the full story appeared in the Fall/Winter 2018 issue of this newsletter (on pages 10-12 – http://www.westiefoundation.org/assets/ipfstudywestienewsfallwinter2018web-4.pdf).

The WFA initiated the collaboration of researchers at Yale and Tufts Universities to look at a potential drug for treatment of PF (the initial scientific work was done at Yale looking for human therapy). Kessler and other owners and friends of Westies with PF, mostly via the Facebook page started by Kessler "Westie Lung Disease—IPF in USA (Treatments, Symptoms, Studies, Etc.)", joined forces to help raise funds for the study. Their fundraising efforts were an outstanding success with approximately $31,000 raised. The WFA has now granted the donated funds to the PF study and it is currently underway.

Inspiration for Facebook Page and GoFundMe

Kessler's dog, Tyler, was diagnosed with PF in 2014 and she began sharing his story and supporting other dog owners going through the same thing via a Facebook page that has grown to more than 2,000 members.

Sadly, Tyler lost his fight to PF on August 26, 2019 at the age of 17. Kessler, in another incredibly selfless gesture, voiced her interest in helping WFA fund another study of PF in dogs in the near future with plans for additional GoFundMe efforts in Tyler's memory.

Message from WFA President Bebe Pinter

"Our heartfelt sympathies go out to PJ and others that have lost their dogs to this horrible disease. PJ kept everyone updated on Tyler's progress since his disease was diagnosed and everyone knew about Tyler and enjoyed photos and stories about him via the Facebook PF group page. It also helped other owners who had Westies or other breeds with PF feel that they were not alone and had a place to share experiences about the disease. PJ understands that while research is slow, we must all be advocates for our dogs and keep pushing for meaningful studies. She is an exemplary role model."

RESEARCH PROGRESS REPORT SUMMARY

Grant 02472-A:
Effect of Lokivetmab on Tissue Biomarkers of Canine Atopic Dermatitis using RNA Sequencing

Principal Investigator:
Frane Banovic, DVM, PhD

Research Institution:
University of Georgia

Grant Amount:
$9,747.00

Start Date: 12/1/2017
End Date: 10/31/2019

Progress Report:
Mid-Year 2

Report Due:
4/30/2019
Report Received:
6/27/2019

(The content of this report is not confidential and may be used in communications with your organization.)

Original Project Description:
Atopic dermatitis (AD) is the most common, chronic, inflammatory and pruritic allergic skin disease that affects dogs worldwide. Treatment of canine AD has a high unmet need for effective and safe therapeutics. The transcriptome investigation of human AD tissues before and after treatment modalities has revolutionized the understanding of the molecular fingerprint of AD, further defining pathogenic immune pathways and identifying disease-specific biomarkers. In the early-phase trial, lokivetmab, a caninized monoclonal antibody targeting interleukin-31 (IL-31) cytokine, markedly improved disease activity, but the effect of IL-31 blockade on AD at the genomic level has not been characterized. The investigators will evaluate lokivetmab modulation of the canine AD transcriptome (defined as differentially expressed genes between lesional and non-lesional skin) using next-generation RNA sequencing (RNA-seq). Findings may suggest that inhibition of a single target has the potential to reverse AD pathomechanisms, opening the door for new targeted treatment for this common and debilitating inflammatory skin disease. Furthermore, transcriptome analysis using RNA-seq may identify novel pathogenic pathways of inflammatory biomarkers as canine AD disease drivers, with potential for development of novel targeted therapeutics.

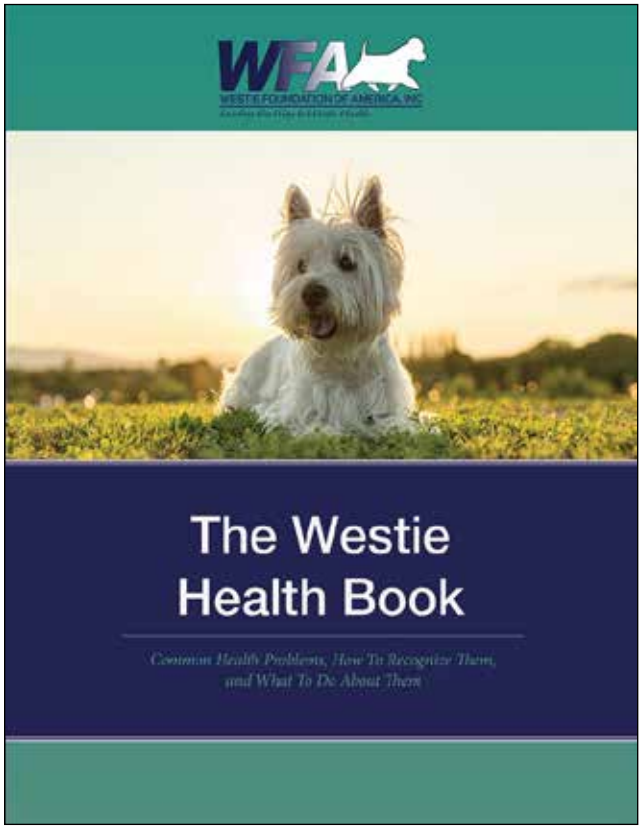
Publications: None at this time.

Presentations: None at this time.

Report to Grant Sponsor from Investigator:
We have collected all the data, including RNA sequencing, and are now analyzing and writing the study results for the reports. A 6-month extension on the project will provide time to complete analysis, determine gene expression, and present results at a national meeting.

Westie Wellness, the official publication of the Westie Foundation of America (WFA) is mailed or emailed quarterly to all contributors. Westie Wellness is printed by Art Communication Systems in Harrisburg, PA. The opinions expressed in the articles herein are those of the authors and not necessarily of the editor or the Officers or Directors of the Westie Foundation. The editor reserves the right to edit all materials submitted for publication. The editor welcomes comments, suggestions, and expressions of opinions from the readership. No portion of Westie Wellness may be printed without the written permission of the editor.

The Westie Foundation of America, Inc is a nonprofit corporation, recognized by the IRS as a 501 (C) (3) organization. The mission of the Foundation is to advance and support medical research to benefit the health and quality of life of West Highland White Terriers: and to further develop and communicate information regarding the health, care, breeding and quality of life of Westies to Westie owners, Westie breeders and veterinarians.



PRINTED COPIES OF THE WESTIE HEALTH BOOK ARE NOW AVAILABLE!

A printed copy of THE WESTIE HEALTH BOOK provides an easily accessible reference to help ensure your Westie's health. There are up-to-date sections on Westie health, breeding, genetics, common diseases in Westies, complementary and alternative medicine, and sections on each of the health problems affecting our beloved breed, written by the foremost researchers and veterinarians who have the greatest knowledge of our breed.

GREAT GIFT FOR YOURSELF, YOUR VETERINARIAN, OR A NEW WESTIE PUPPY OWNER!

LINK TO WFA WEBSITE ORDER FORM: westiefoundation.org/westie-e-book.html
or fill out the form below and mail it in. Thank You!

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Add $10 per book for foreign postage
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Westie Cartoon Caption Contest

Create the winning caption for this Westie cartoon. Please send your caption to bjpinter@msn.com before November 15, 2019. The winner and runner-up will be announced in the next newsletter with their captions.

Create a Caption for this Cartoon

Copy of original watercolour by Ruth Sutcliffe, England

Winning Caption of Last Cartoon!

Meredith Kling

"An example of Westie's selective hearing!"

WESTIE FOUNDATION OF AMERICA, INC

Leading the Way to Westie Health

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