8/1/2017

NEW GRANTS AWARDED 2017 YEAR-TO-DATE

Blood Disease Research Program Area

02343-A: Recognizing and Removing Lipemic Interferences for Accurate Laboratory Testing
Principal Investigator: Unity Jeffery, VetMB; Texas A&M University
Total Grant Amount: $9,113; Grant Period: 5/1/2017 - 4/30/2018

Over thirty percent of Miniature Schnauzers have primary hyperlipidemia, a disease in which fats (also termed lipids) are increased in the blood. Lipids are also increased in dogs who have recently eaten or are affected by disorders that alter lipid handling (e.g. diabetes, hypothyroidism, Cushing's disease). Blood samples collected from affected patients are milky and opaque due to large numbers of lipid droplets. Many blood tests rely on measuring a color change or light transmission through a sample, but lipid droplets absorb light and cause random light scatter preventing accurate measurement of these changes. High blood lipids may prevent clinically important tests from being performed or render their results inaccurate. Incorrect diagnosis or treatment may occur, or unnecessary invasive and expensive tests may be performed because of these inaccurate results. Two techniques are commonly used to reduce lipids before analysis: high-speed centrifugation or addition of a lipid extraction solution. For human samples, centrifugation is insufficient to remove lipid for some tests, but the lipid extraction solution produces inaccuracies in others. In dogs, the effect of the two techniques on subsequent analyses has not been well-established, preventing selection of the most appropriate lipid removal technique. The investigators will establish which biochemistry tests are altered by high lipids and determine the best means to remove the lipid interference, thereby improving the accuracy of laboratory testing and veterinary care.

02355-A: Hyperlipidemia in the Miniature Schnauzer: A Metabolomic and Genomic Approach
Principal Investigator: Christopher O'Callaghan, MD, PhD; University of Oxford
Total Grant Amount: $14,958; Grant Period: 8/1/2017 - 7/31/2018

Miniature Schnauzers can be affected by a condition causing too much circulating lipid (fat) in the bloodstream, known as hyperlipidemia. The problem appears to worsen as dogs get older and may affect up to 3 in every 10 dogs. Affected dogs are more likely to suffer from other serious health conditions including pancreatitis and diabetes, and liver and kidney problems. Whilst an underlying genetic cause is suspected, the gene or genes responsible for this condition in Miniature Schnauzers have not been identified. At present, routine blood tests only allow veterinarians to measure 2 types of lipid - triglyceride and cholesterol. In contrast, in human lipid disorders, improved diagnosis and personalized treatment options have been achieved by measurement of a much wider variety of lipids in the bloodstream, combined with genetic testing. The investigators will measure over 2000 substances including lipid- and metabolism-related markers in the blood of Miniature Schnauzers to improve understanding of hyperlipidemia that may guide more specific treatment options. The researchers will also examine differences between genes of affected and unaffected Miniature Schnauzers, to try to identify important mutations associated with hyperlipidemia. These studies may lead to a genetic screening test and/or new targets for treatment of this condition.

Cardiology Research Program Area

02327-MOU: Identification of Genetic Markers for Familial Subvalvular Aortic Stenosis in Bullmastiffs
Principal Investigator: Joshua Stern, DVM, PhD; University of California, Davis
Total Grant Amount: $55,173; Grant Period: 4/1/2017 - 3/31/2019

Subvalvular Aortic Stenosis (SAS) is a heart defect characterized by a fibrous ridge located below the aortic valve. Affected dogs are at risk of developing heart valve infections, congestive heart failure or sudden death. Severely affected dogs have an average lifespan of 19 months. SAS is an inherited heart problem reported in Bullmastiffs and other breeds. Studying this disease in Bullmastiffs has the potential to identify a genetic mutation and develop a test for this condition. Ultimately the identification of a mutation in Bullmastiffs would aid breeders in making decisions to reduce the prevalence of this condition. The objective of this study is to use the most modern genetic techniques to identify the genetic cause of SAS in Bullmastiffs. The investigators have collected DNA samples from affected and unaffected Bullmastiffs and will study inheritance to identify genetic variants associated with SAS.

Funding for the research is provided through the collaborative efforts and generosity of the American Bullmastiff Association. The AKC Canine Health Foundation supports the funding of this effort and will oversee administration of funds and scientific progress reports.

02388-MOU: Genetic Markers for Familial Subvalvular Aortic Stenosis in Newfoundlands
Principal Investigator: Joshua Stern, DVM, PhD; University of California, Davis
Total Grant Amount: $58,949; Grant Period: 9/1/2017 - 8/31/2019

Subvalvular Aortic Stenosis (SAS) is a heart defect characterized by a fibrous ridge located below the aortic valve. Affected dogs are at risk of developing heart valve infections, congestive heart failure or sudden death. Severely affected dogs have an average lifespan of 19 months. A previous study identified a single gene mutation associated with a cohort of Newfoundland dogs with SAS, however this mutation does not explain all SAS in the breed and requires further evaluation. Studying this disease in Newfoundlands has the potential to identify causative genetic mutations and develop a reliable genetic test for this condition to further aid breeders to reduce the prevalence of this condition. The investigators will study pattern of inheritance and use the most modern genetic techniques to identify the genetic cause of SAS in Newfoundlands, further expanding our understanding of this disease in dogs.

Funding for the research is provided through the collaborative efforts and generosity of the Newfoundland Club of America Charitable Trust. The AKC Canine Health Foundation supports the funding of this effort and will oversee administration of funds and scientific progress reports.

02368: Identification of Mitral Valve Disease DNA variants in Miniature Schnauzers
Principal Investigator: Kathryn Meurs, DVM, PhD; North Carolina State University
Total Grant Amount: $56,635; Grant Period: 8/1/2017 - 7/31/2019

Mitral valve degeneration is the most common heart disease in the dog, and is particularly common in small breed dogs. Miniature Schnauzers are one of the most commonly affected breeds. Although some dogs live comfortably with the disease, many affected dogs die of congestive heart failure and sometimes sudden death due to rupture of a weakened heart. Mitral valve degeneration is thought to be an inherited disease in the dog although the causative mutation(s) have not been identified. Failure to understand the underlying cause of canine mitral valve degeneration has slowed the development of effective treatment and prevention plans. The investigators will identify genetic variants that lead to the development of mitral valve degeneration in Miniature Schnauzers, and use this information to develop treatment and prevention plans for dogs with high-risk DNA variants.

02389-MOU: Characterization of Ventricular Arrhythmias in Rhodesian Ridgebacks
Principal Investigator: Kathryn Meurs, DVM, PhD; North Carolina State University
Total Grant Amount: $26,919; Grant Period: 9/1/2017 - 8/31/2020

The investigators recently identified a genetic mutation associated with heart arrhythmias in Rhodesian Ridgebacks. Dogs with the mutation appear to be at the most risk of developing an arrhythmia and suffering sudden death between 12-24 months of age, however, this timeline is variable, and some dogs appear to outgrow the arryhthmia. Due to the lack of knowledge of the specific at risk age, owners of dogs with the mutation must repeat the Holter monitor (a test to monitor heart rhythm) every few months to identify when their dog is at greatest risk and may need treatment. The objective of this study is to repeatedly perform regular Holter monitor testing on dogs with the mutation (including dogs with one copy and with two copies) every 4 months from 6-24 months of age with a final evaluation at 36 months to narrow in on the age when the arrhythmias appear to be the most severe. Gaining this increased clinical understanding of the disorder will decrease the risk of sudden death by helping owners and veterinarians in monitoring and providing treatment intervention for their dogs, and will further inform breeders and owners by characterizing the clinical and genetic manifestations of the disorder.

Funding for the research is provided through the collaborative efforts and generosity of the Rhodesian Ridgeback Charitable Foundation. The AKC Canine Health Foundation supports the funding of this effort and will oversee administration of funds and scientific progress reports.

Endocrinology Research Program Area

02342-A: Molecular Analysis of Giant Schnauzer-Type Congenital Hypothyroidism
Principal Investigator: John Fyfe, DVM PhD; Michigan State University
Total Grant Amount: $14,900; Grant Period: 6/1/2017 - 5/31/2018

Isolated congenital hypothyroidism (CH) is a condition occurring at or near birth characterized by insufficient thyroid hormone production. The disorder in purebred dogs is usually inherited and leads to dwarfism and mental dullness. CH in Giant Schnauzers (GS) was first described in 1991 (Greco, et al) as a likely autosomal recessive disorder due to failed activity of the hypothalamus or pituitary gland. Since then the investigators have studied GS CH in three widely separated families and found pituitary failure of thyroid stimulating hormone (TSH) production beginning at birth in most affected dogs, but not until several months of age in a few. They mapped the genetic locus to a region of dog chromosome 28. The researchers will now perform DNA sequencing experiments of affected dogs and their parents and candidate variants will be assessed further by Sanger sequencing in all available members of the three families, as well as a large number of GS DNA samples available in the OFA CHIC repository. A successful outcome will lead to a reliable genetic test for GS CH, increased understanding of an essential pituitary function, and illumination of a highly similar condition reported in Miniature Schnauzers.

02366-A: Individualization of Pharmacological Interventions in Diabetic Dogs
Principal Investigator: Nicolas Villarino, Med.Vet.; Washington State University
Total Grant Amount: $14,435.00; Grant Period: 5/1/2017 - 4/30/2018

Diabetes mellitus is a disease of middle-aged to older dogs which means many affected dogs will develop other diseases such as arthritis, infections, and behavior disorders, all requiring drug therapy. Poor control of glucose levels in diabetic dogs can alter how drugs behave in the body, which can result in drug toxicities. This is an area of intense investigation in diabetic humans, but such effects have not been investigated in canine medicine, and prescribed treatments may result in individual dogs being under- or overdosed. The investigators intend to move from a 'one dose fits all' strategy to an individualized medical approach to ensure each patient receives optimal pharmacological therapy. Completion of this study is the first step toward establishing an in vitro method for evaluating the many drugs used in diabetic dogs. The long-term goal is to develop a free downloadable application for mobile devices (smartphones and tablets), for use by clinicians to make treatment selection, and to avoid drugs that may cause problems in diabetic patients. This research stands to play a substantial role in the clinical management of dogs with diabetes mellitus.

Gastrointestinal Disease Research Program Area

02338: The Genetics of Bloat in German Shepherd Dogs: The Roles of Immune System Genes and the Gut Microbiome
Principal Investigator: Michael Harkey, PhD; Fred Hutchinson Cancer Research Center
Total Grant Amount: $152,270; Grant Period: 6/1/2017 - 5/31/2019

While Gastric Dilatation Volvulus (GDV or bloat) is a serious problem for many large canine breeds, little is known about the causes of this deadly disease. The most significant factors may be genetic, since certain breeds are more susceptible than others, and strong familial predispositions are seen within breeds. The investigators have recently shown a significant association of three immune genes with bloat in Great Danes. For each of the three genes, one allele (variant) is found at unusually high frequency in dogs that have been treated for bloat, and the presence of any one of these "risk" alleles triples the chance that the dog will experience bloat at some time in its life. The research team also showed that the bacterial population living in the gut (the gut microbiome) is altered in dogs with bloat, and in dogs that carry these "risk" alleles, which may predispose these dogs to bloat. It is not known if other breeds show this same association of genetics and microbiome with bloat. The team will investigate whether bloat in German Shepherd Dogs is associated with the same risk alleles and the same microbiome profiles as were seen in Great Danes. The results of this work could lead to genetic tests for at-risk dogs, as well as dietary and probiotic therapies to prevent bloat.

Hepatic Disease Research Program Area

02363-A: Platelet Function in Dogs with Chronic Liver Disease
Principal Investigator: David Panciera, DVM; Virginia-Maryland Regional College of Veterinary Medicine
Total Grant Amount: $14,904; Grant Period: 6/1/2017 - 5/31/2018

Chronic liver disease is common among adult dogs with numerous breeds being predisposed. Liver biopsy is usually required to identify the underlying cause of liver disease in these patients, and is often recommended to monitor response to treatment. Because dogs with liver disease have abnormal clotting activity, bleeding is a substantial risk of biopsy. Routine screening for clotting abnormalities in dogs with liver disease is accomplished using blood tests including prothrombin time, partial thromboplastin time, and platelet count. Unfortunately, these routine tests do not necessarily correlate with excessive biopsy-induced bleeding, which makes predicting and preventing hemorrhage during liver biopsy difficult. Humans with liver disease have abnormal platelet function that contributes to abnormal coagulation. Because standard diagnostics do not assess platelet function, we propose to evaluate platelet function in dogs with chronic liver disease. The investigators will determine if dogs with chronic liver disease have platelet dysfunction and if there is a correlation between platelet function and bleeding after liver biopsy. to the research team will use two methods to evaluate platelet function in canine patients with chronic liver disease undergoing ultrasound guided liver biopsies to determine if there is a relationship between platelet function and hemorrhage after biopsy.

Immunology and Infectious Disease Research Program Area

02380-A: Estimating Prevalence and Identifying Risk Factors for Canine Leptospirosis in North America
Principal Investigator: Jason Stull, VMD, PhD; Ohio State University
Total Grant Amount: $14,990; Grant Period: 5/1/2017 - 10/31/2018

Leptospirosis is an important and re-emerging disease of dogs, humans and other species that is transmitted by contact with infected urine. Infected dogs can develop severe illness, including death. Despite being recognized as a disease that appears to be increasing in frequency in dogs across the United States and Canada, many areas important to dog health are unknown. Regions of greatest canine leptospirosis risk, dog factors that increase risk and the most important prevention methods remain unclear. The investigators will use an existing large international database of dogs to determine the occurrence and changes over time and region of this disease. Current "hot spots" for canine leptospirosis will be determined. These "hot spots" will be further evaluated in detail by enrolling dogs and their owners in a follow-up study component to identify key behaviors and practices that can be used to successfully reduce the risk of leptospirosis in dogs. Maps will be created for use by dog owners and veterinarians to identify areas of greatest risk and concern for this disease. Together, maps and risk reduction data will allow for targeted education to individuals with dogs living or traveling to higher-risk areas to protect dogs against leptospirosis.

Lung and Respiratory Disease Research Program Area

02346-A: Blood Culture and Blood Microbiome as Minimally Invasive Diagnostics for Canine Bacterial Pneumonia
Principal Investigator: Carol Reinero, DVM, PhD; University of Missouri
Total Grant Amount: $11,394; Grant Period: 6/1/2017 - 5/31/2018

Canine bacterial pneumonia is a common and serious respiratory infection. Pneumonia can develop from contagious environmental bacteria or from the dog's own bacteria gaining access to the lungs (e.g., after accidentally inhaling food, liquids or vomit). Diagnosis relies on clinical signs, x-rays, and lung fluid (bronchoalveolar lavage fluid or BALF) analysis. Analysis of BALF helps identify the causative bacteria and aids in appropriate antibiotic selection. While key to definitive diagnosis and management of bacterial pneumonia, collection of BALF requires general anesthesia, which can be especially risky in dogs with severe lung disease. To address the clinical need for a minimally invasive diagnostic test, the first study objective is to determine if blood cultures, acting as a surrogate for BALF analysis, can identify the bacteria causing pneumonia and provide antibiotic susceptibility information. In addition, the investigators will employ molecular means of identification of bacterial populations in samples, so called "microbiome" analysis. Researchers will compare BALF and blood microbiomes to determine sample relatedness and then to the bacteria identified via BALF culture to determine if lung bacteria appear in the blood in minute quantities and whether the predominant cultured bacteria is reflected in the blood microbiome.

Ophthalmology Research Program Area

02332-A: Identification of Mutations for Primary Lens Luxation in Multiple Dog Breeds
Principal Investigator: Cathryn Mellersh, PhD; Animal Health Trust
Total Grant Amount: $14,812; Grant Period: 5/1/2017 - 4/30/2018

Primary lens luxation (PLL) is a painful inherited disease that affects many breeds of dog. A mutation in the gene ADAMTS17 has been identified that causes PLL in at least 20 breeds and DNA tests are available for these breeds. Different mutations in ADAMTS17 are also known to cause a different disease, primary open angle glaucoma (POAG), in a small number of additional breeds and POAG in two more breeds is known to be caused by mutations in the closely related gene ADAMTS10. POAG is characterized by increased pressure within the eye that is due to abnormalities deep within the part of the eye known as the ciliary cleft that disrupt the normal drainage of fluid within the eye. Although PLL and POAG are different diseases, they are both caused by abnormalities in the part of the eye known as the ciliary body or in nearby tissues. There are currently several breeds that are affected by PLL but for which mutations are currently unknown. The investigators will investigate both ADAMTS10 and ADAMTS17 for novel mutations that explain PLL in five breeds of dog. The DNA sequence data can also be used to facilitate future studies of other inherited disorders in dogs, beyond the scope of this study.

02336: Genetics of Primary Angle Closure Glaucoma in American Cocker Spaniels
Principal Investigator: Sara Thomasy, DVM, PhD; University of California, Davis
Total Grant Amount: $40,000; Grant Period: 5/1/2017 - 4/30/2018

Glaucoma is a leading cause of irreversible blindness and globe removal (enucleation) in dogs. Primary angle closure glaucoma (PACG) is the most common form of glaucoma in dogs whereby acute blockage of the iridocorneal angle leads to a rapid increase in intraocular pressure. Consequently, PACG is painful, demands immediate medical attention, and often causes incurable vision loss. The American Cocker Spaniel (ACS) has the highest reported prevalence of any canine breed for PACG. The investigators will study the genetics of PACG in the ACS to identify potential disease-causing loci and variants. Dogs will be extensively phenotyped as PACG cases or controls using advanced imaging equipment used to investigate glaucoma in human patients. Identification of genetic markers associated with PACG in ACSs will facilitate the development of a genetic test to inform breeding programs. Furthermore, identification of the molecular basis of PACG may help elucidate novel therapeutic or testing strategies in the management of this blinding disease that may be translatable to the human condition.

02340: Clinical and Genetic Background of Progressive Retinal Atrophy in Miniature Schnauzers
Principal Investigator: Hannes Lohi, PhD; University of Helsinki and the Folkhälsan Institute of Genetics
Total Grant Amount: $46,224; Grant Period: 12/1/2017 - 11/30/2018

Dogs may be affected with hereditary eye disorders, which cause severe vision impairment, and sometimes progress to complete blindness. One hereditary condition is progressive retinal atrophy (PRA), in which the light-sensing receptors in the retina are lost, leading to complete blindness. Currently there are no treatment options for this disease. The development of genetic testing would be an important breakthrough for veterinary medicine. The identification of a causative gene would also enable a study of the molecular background of the disease for improved treatment plans. The investigators have established a large pedigree and clinically-investigated sample cohort in Miniature Schnauzers with PRA to identify its genetic cause, and have already identified the chromosomal region suspected to harbors the causative gene. Through this study, they researchers hope to identify a PRA gene and mutation, leading to a genetic test for the eradication of this disorder from the Miniature Schnauzer breed.

Neurology Research Program Area

2387-MOU: Hereditary Deafness in Dogs – Genomic Studies in English Setters Using Full Sibling Pairs
Principal Investigator: George Strain, PhD; Louisiana State University
Total Grant Amount: $12,960; Grant Period: 9/1/2017 - 8/31/2018

Hereditary deafness associated with white pigmentation occurs in several dog breeds. The mechanism of inheritance is unknown, but does not appear to be simple Mendelian. Numerous studies to determine the mode of inheritance and locate the causative gene(s) have thus far failed.
The investigators will use a unique modified twin study approach in an effort to determine the mode of inheritance and locate the causative gene(s). Full-sibling littermates will be identified, where one puppy has normal hearing and one is deaf. Like human twins, full siblings should have very similar DNA, which will reduce the variability of the DNA samples when compared to studies of unrelated dogs. The study of pairs of English Setters will be added to an ongoing study examining differences in Dalmatian and Australian Cattle Dog pairs. Identifying candidate deafness genes will be an important breakthrough to understanding deafness in dogs and people, with a goal to establish a genetic test to reduce or eliminate deafness in these canine populations.

Funding for the research is provided through the collaborative efforts and generosity of the English Setter Association of America. The AKC Canine Health Foundation supports the funding of this effort and will oversee administration of funds and scientific progress reports.

Tick-Borne Disease Research Program Area

02383: Identifying Cellular Mechanisms of Inflammation During Canine Tick-Borne Diseases
Principal Investigator: Christine Petersen, DVM, PhD; University of Iowa
Total Grant Amount: $207,526; Grant Period: 9/1/2017 - 8/31/2019

Tick-borne diseases are found in all 50 states of the United States and are the most common vector-borne disease diagnosed in people in the US. The predominant disease is Lyme disease, caused by *Borrelia burgdorferi* and related species. Other important canine tick-borne diseases include those caused by *Anaplasma platys*, *Anaplasma phagocytophilum* (Anaplasmosis), *Babesia canis*, *Babesia conradea* and *Babesia gibsonii* (Babesiosis), and *Ehrlichia canis*, *Ehrlichia chaffiensis* and *Ehrlichia ewingii* (Ehrlichiosis). Many of these diseases also affect people. Dogs can serve as sentinel species for human disease and there are many areas where the immune responses and disease outcomes are very similar in people and dogs, meaning that important lessons can be learned by sharing information between human and animal health (One Health). The researchers will further investigate the dog's immune system to determine which immune cells are responsible for the cure or creation of canine tick-borne disease. Through understanding which cells are responsible for causing disease, the goal is to then specifically target the molecules they produce using immunotherapy or immune modulation to improve treatment of tick-borne diseases in all dogs.

02386-A: Surveillance of *Hepatozoon americanum* In Populations of the Gulf Coast Tick Vector
Principal Investigator: Andrea Varela-Stokes, DVM, PhD; Mississippi State University
Total Grant Amount: $12,960; Grant Period: 12/1/2017 - 11/30/2019

American Canine Hepatozoonosis is a debilitating tick-borne disease with poor prognosis and limited treatment options. Affected dogs usually experience fever, muscle pain, and body wasting. Some dogs may have a thickening of their long bones. While most tick-borne diseases occur after transmission of the disease agent during tick feeding, in American Canine Hepatozoonosis, dogs are infected by eating the tick vector carrying the disease agent. *Hepatozoon americanum* is the agent that causes American Canine Hepatozoonosis. It is a protozoan parasite carried by the tick species, *Amblyomma maculatum*, also known as the Gulf Coast tick. The percentage of Gulf Coast ticks carrying *H. americanum* is unknown. The investigators will use an optimized test to perform active surveillance on Gulf Coast ticks collected in Mississippi during the summer seasons of 2018 and 2019 when adult Gulf Coast tick stages are active. Veterinary summer research students will participate in the research each year. By involving veterinary students and obtaining active surveillance data on tick populations, the researchers will fill an important gap in our knowledge of American Canine Hepatozoonosis, and increase veterinary and public awareness of potential risk in canine patients.

2017 Clinician-Scientist Fellowship Program Area

Jeanie Lau, BVSc; North Carolina State University
Mentor: Karen R. Munana, DVM, MS, DACVIM
Total Grant Amount: $12,000; Grant Period: 1/1/2017 - 12/31/2017

Dr. Lau received her bachelor's degree in Neuroscience from Dartmouth College and her veterinary degree from the University of Sydney. Upon graduation from veterinary school, Dr. Lau practiced as an associate veterinarian before completing both a rotating small animal internship and a neurology specialty internship. Dr. Lau is now in a residency training program in Neurology and Neurosurgery at North Carolina State College of Veterinary Medicine.

Dr. Lau's research on Steroid Responsive Meningitis-Arteritis (SRMA) in dogs will involve characterizing the clinical and diagnostic findings and response to therapy in a population of dogs with SRMA in North America. Comparisons will be performed to identify differences in the disease with respect to breed.

Jennifer Reinhart, DVM, DACVIM; University of Wisconsin
Mentor: Lauren A. Trepanier, DVM, PhD, DACVCP, DACVIM
Total Grant Amount: $12,000; Grant Period: 1/1/2017 - 12/31/2017

Dr. Reinhart received her veterinary degree from the University of Illinois, completed a small animal internship at Cornell University, and completed a small animal internal medicine residency at Kansas State University. She is a diplomate of the American College of Veterinary Internal Medicine and is currently pursuing a PhD degree at the University of Wisconsin School of Veterinary Medicine.

The focus of Dr. Reinhart's research is the identification of genetic and breed risk factors for sulfonamide hypersensitivity in dogs. She has identified a candidate gene and is working to validate this finding in hypersensitive dogs. This work also entails determining susceptibility in specific breeds (particularly the Doberman Pinscher).

Takashi Taguchi, DVM; Western University of Health Sciences
Mentor: Dominique Griffon, DMV, PhD, DECVS, DACVS
Total Grant Amount: $12,000; Grant Period: 1/1/2017 - 12/31/2017

Dr. Taguchi received his veterinary degree from the Osaka Prefecture University in Japan and completed a small animal surgery internship at Tokyo University of Agriculture and Technology.

Dr. Taguchi will study the influence of donor's age on canine adipose-derived mesenchymal stem cells at Western University of Health Sciences College of Veterinary Medicine where he is. Dr. Taguchi's long-term goals are to address challenges currently faced in orthopedics as a clinician scientist, using sound research design to advance the prevention, diagnosis, treatment, and well-being of small animals.