UCDAVIS
VETERINARY MEDICINE
Center for Companion Animal Health

2021 Annual Report
Center for Companion Animal Health

Dr. Michael Kent with Danson Kent-Jandrey
Oncology & ER/ICU

Letter from the Director:

Another year has passed and it is time to once again update you on the Center for Companion Animal Health's progress that we have made in improving the lives and welfare of our companion friends and in finding new treatments and cures for disease. It's been another challenging year for so many, but we are seeing light at the end of the tunnel. While our hospital is still impacted with the increased demand for veterinary services, research has largely returned to normal and our Center has not skipped a beat.

Throughout this report we highlight the newly funded projects that have started along with summaries of the completed published studies that show the progress we have made with your help. We also have several new, exciting things that we report here – including a grant from the National Cancer Institute to train the next generation of cancer researchers and support from the State of California for us to run a grant program for shelters that is a start towards the promise of making California a no-kill state.

This year's report features the companions of faculty and staff as photographed by our school photographer Don Preisler. He has done a beautiful job capturing images of those we love and who inspire us to work harder and achieve more. You can even find my new dog, Danson, and my two cats, Roo and Zumi, in the pages here – unfortunately I could not figure out how to bring my fish or seahorses in so there are no pictures of them. I hope you enjoy seeing just some of the amazing creatures, great and small, that share our lives.

Our Center is entirely dependent on you and your philanthropy to fund all that we do. The consistent support we receive ensures that we can continue to do the groundbreaking research needed. Thank you for partnering with us and entrusting us with your support – we so appreciate all the help and support we receive.

We will continue to work to make next year a great one with even more promise – and with your help and friendship we will succeed.

My best,

Michael S. Kent, MAS, DVM, DACVIM, DACVR
Director, Center for Companion Animal Health
UC Davis, School of Veterinary Medicine

Front cover: Roo & Zumi Kent-Jandrey
Oncology & ER/ICU

Back cover: Mack Delany
Shelter Medicine

Thank you for making an impact!

Our mission is to improve the health of companion animals by encouraging and supporting basic science and clinical research. This could not be possible without your support!

How donor support makes an impact:

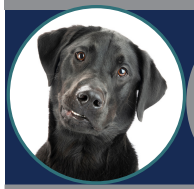
Faculty Research:
Awarded to our faculty to support the most innovative research to advance companion animal health.

Resident Research:
Resident research projects allow the opportunity to carry out impactful research under the close mentorship of the faculty.

Research Equipment:
Allow our faculty to purchase new equipment needed to carry out research, as well as, repair and replace old equipment.

2020-2021 SUPPORT

Center for Companion Animal Health



INDIVIDUAL DONORS

1,426 donors
3,893 total gifts

TOTAL DONATIONS

$1,226,554

IN MEMORY

28,576 pets memorialized through donations

OUR FUTURE

Endowments increased by 22.6% to $46,546,480
2020-2021 endowment earnings $855,496

Images from top to bottom:
Walter Dang - Neurology / Neurosurgery
Enoki Vernau - Neurology / Neurosurgery
Hudson Lenske - ER/ICU
Honeybee Pinkston - Neurology / Neurosurgery

Top of page image: Moxie & Archie Larsen - Nutrition
Bottom images, left to right: Roo Kent-Jandrey-Oncology & ER/ICU, Cilantro Culp & Palm-Soft Tissue Surgery & Internal Med, Millie Burkitt - ER/ICU

CAMF Partnering Clinics

Thank you to our Companion Animal Memorial Fund veterinary partners for helping the CCAH make an impact on animal health. We are pleased to recognize the veterinarians and clinics who supported the CAMF program in 2020, raising over $200,000.

Acorn Hills Animal Center
Acorn Veterinary Clinic, Inc.
Adobe Veterinary Centers, LP
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Aggie Animal Dental Center
Agoura Animal Clinic, Inc.
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B & B Veterinary Hospital, Inc.
Banderas Pet Hospital, Inc.
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Bear Valley Animal Clinic
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Bird & Pet Clinic of Roseville
Bishop Ranch Veterinary Center
Bishop Veterinary Hospital, Inc.
Blue Cross Pet Hospital
Blue Cross Veterinary Hospital
Blue Cross Veterinary Hospital, Inc.
Blue Oak Veterinary Hospital
Blue River PetCare
Brentwood Family Pet Care
Broadway Pet Hospital, Inc.
Camarosa Veterinary Clinic
Cambria Veterinary Clinic
Cameron Park Veterinary Hospital, Inc.
Camino Real Pet Clinic, Inc.
Canyon Hills Animal Clinic, Inc.
Care Veterinary Hospital
Carlsen Animal Hospital, Inc.
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Cat Clinic
Cats Only Veterinary Hospital, Inc.
Cedar Veterinary Hospital
Central Coast Veterinary Acupuncture
Ceres Veterinary Clinic, Inc.
Chabot Veterinary Clinic
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Coastside Veterinary Clinic, Inc.
Codornices Veterinary Clinic, Inc.
Coffee Road Veterinary Clinic
Colusa Veterinary Hospital
Companion Pet Clinic - Aloha
Companions A. H., Inc.
County Line Animal Hospital, Inc.
Cross Street Small Animal Veterinary Hospital
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Daniela P. Gestine, D.V.M.
Debra Hoffman Berry, D.V.M.
Debra K. Melcon, D.V.M.
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Doctors Pet Clinic
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East San Rafael Veterinary Clinic
East West Fusion
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Keely A. Commins, D.V.M.
Kelly Chaffin, D.V.M.
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Kittel Family Veterinary Practice, Inc.
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Ladera Ranch Animal Hospital, Inc.
Laguna Veterinary Hospital
Larkspur Landing Veterinary Hospital, Inc.
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Los Alamitos Animal Hospital, Inc.
Los Osos Pet Hospital
Manteca Veterinary Hospital
Maria I. Kuty, D.V.M.
Marina Hills Animal Hospital, Inc.
Mary Avalle, D.V.M.
Mary Press, D.V.M.
Matilija Veterinary Hospital, Inc.
McKenzie Animal Clinic, Inc.
Michael Gadd, D.V.M.
Michele C. Chin, D.V.M.
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Mid-Valley Veterinary Hospital
Miramonte Veterinary Hospital
Mobile Paws Veterinary Services
Mono Way Veterinary Hospital, Inc.
Monte Vista Animal Hospital
Montecito Animal Clinic
Moore Veterinary Care
Moraga Veterinary Hospital
Morro Bay Veterinary Clinic
MSSAH, Inc.
Muir Oaks Veterinary Hospital
Murphy Avenue Veterinary, Inc.
Napa Valley Veterinary Hospital, Inc.
National Veterinary Associates
Newbury Park Veterinary Clinic
Newport Hills Animal Hospital, Inc.
Northgate Veterinary Hospital
Northtown Guardian Vet Hospital Corp.
Oak Park Veterinary Clinic
Oakland Veterinary Hospital
Oakridge Veterinary Clinic, Inc.
Occidental Veterinary Hospital
Ocean Beach Veterinary Clinic
Old Towne Animal Hospital
Orange Canyon Pet Clinic
Oxnard Veterinary Hospital
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Petaluma Central Animal Hospital, Inc.
PetVet Care Centers Mgmt LLC
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Rancho San Carlos Pet Clinic
Rancho Viejo Animal Hospital
Red Rabbit Veterinary Hospital, Inc.
Redlands Animal Hospital, Inc.
Redwood Veterinary Hospital
Reedley Veterinary Hospital
Richmond Veterinary Hospital
River Oak Veterinary Hospital, Inc.
Ross Valley Veterinary Hospital
Sage Rock Veterinary Services, P.C.
Samantha K. Hunt, D.V.M.
San Carlos Animal Hospital
San Francisco Pet Behavior Consulting
San Joaquin Veterinary Hospital
San Juan Veterinary Hospital
Scotts Valley Veterinary Clinic, Inc.
Seven Hills Veterinary Hospital, Inc.
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Sheryl Eckstein, D.V.M.
Slate Creek Animal Hospital
Sonali Veterinary Corporation, APC.
South County Animal Hospital
Spring Valley Animal Medical Hospital, Inc.
Steele Canyon Veterinary Clinic, APC
Summit Veterinary Hospital & Kennels
Sunnyvale Veterinary Clinic, Inc.
Sunset Cliffs Animal Hospital
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Susan Chew, D.V.M.
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Tehachapi Veterinary Hospital, Inc.
Terra Linda Veterinary Hospital, Inc.
The Ark Pet Hospital, Inc.
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Turquoise Animal Hospital
United Veterinary Care, LLC
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Valley Animal Hospital of Merced
Valley Veterinary Clinic RB, Inc.
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VCA Loomis Basin Veterinary Clinic
VCA McClave Veterinary Hospital, Inc.
VCA West Los Angeles Animal Hospital
Veterinary Centers of America
Veterinary Medical Center of Turlock, Inc.
Veterinary Medical Center, Inc.
Village Oak Veterinary Hospital
Village Veterinary Clinic
Village Veterinary Clinic, Inc.
Village Veterinary Hospital
Walker Street Dog & Cat Hospital
Walnut Creek Veterinary Hospital
Washington Square Veterinary Clinic
Western Veterinary Partners
Wikiup Veterinary Hospital
Wilbak Corporation
William L. Klein, D.V.M.
Willow Rock Pet Hospital, Inc.
Woodside Veterinary Clinic

Friends of Companion Animals Honor Roll

We are grateful for the generous support from our donors who are committed to improving the lives of companion animals. We are pleased to recognize donors who contributed $1,000 or more to the CCAH from July 1, 2020 to June 31, 2021.

Anonymous
Don Abbott
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Stacey Baba and James Vokac Charitable Foundation
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Zalec Familian & Lilian Levinson Foundation
Lin Zucconi

Kato Gibson
Small Animal Surgery

Our Team

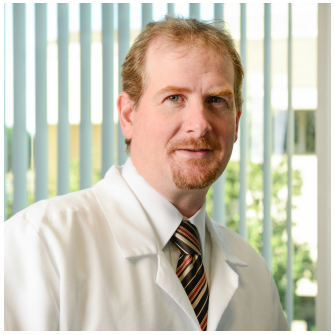
CCAH Scientific Advisory Committee

Our dedicated committee members review all grants submitted by faculty and residents to assess the scientific merit of each proposed study and competitively decides which studies are the most promising to fund. Each member serves a five-year renewable term.

Michael Sean Kent, DVM, Dip. ACVIM, Dip. (Oncology) ACVR (RO), ECVDI (RO)
Director
Dr. Kent is a radiation oncologist who is interested in advanced radiation techniques to improve clinical outcomes. His primary research interest is in radioimmunotherapy – combining radiation along with immunotherapy to treat cancer. He has a dog, a career-change service dog, two rescue Burmese cats, fish, and seahorses.

Danika Bannasch, DVM, PhD
Associate Director - Genetics
Dr. Bannasch's clinical work is on Veterinary Genetics with a research focus on inherited diseases in dogs. Dogs are her favorite animal, and she currently has a dog named, "Pint."

Kate F. Hurley, DVM, MPVM, Dip. ABVP (Shelter Medicine)
Associate Director – Shelter Medicine
Dr. Hurley's primary research interests include the relationship between environment, health and reducing shelter euthanasia; and humane and effective strategies to manage community cats. Her clinical focus is working with shelters to improve the conditions for animals and people while reducing the number of animals euthanized. Hurley has a one-eyed orange cat who thinks he's a pirate.



Rob Rebhun, DVM, PhD, Dip. ACVIM (Oncology)
Associate Director – Cancer
Dr. Rebhun's clinical interests center on cancer with a focus on osteosarcoma and metastasis. His research is on comparative and translational oncology, bridging cancer knowledge from bench-to-bedside. His family has a dog, cats, guinea pig, cockatiel, rats, and rabbit.

Peter Dickinson, BVSc, PhD, Dip. ACVIM (Neurology)
Dr. Dickinson's research is focused on Neurooncology and the genetics of heritable neurological diseases, with a clinical emphasis on Neurooncology. His pets include three badly behaved goats, one very badly-behaved dog, and four well-behaved chickens.

Amy S. Kapatkin, DVM, MAS, Dip. ACVS
ACVS Founding Fellow in Joint Replacement Surgery
Dr. Kapatkin's clinical focus is small animal orthopedics with an emphasis on trauma. Her research includes gait analysis as an objective measurement tool and biomechanical studies to test orthopedic implants. Dr. Kapatkin has a Boston Terrier, her favorite dog breed.

David J. Maggs. BVSc (Hons), Dip. ACVO
Dr. Maggs' research focus is herpetic ocular disease of cats and dry eye disease of dogs and cats. His clinical focus is on ocular surface diseases. Although he considers himself probably more of a dog person, he finds his feline patients the most intriguing. They are much more challenging to diagnose and treat and he (usually!) loves the challenge.

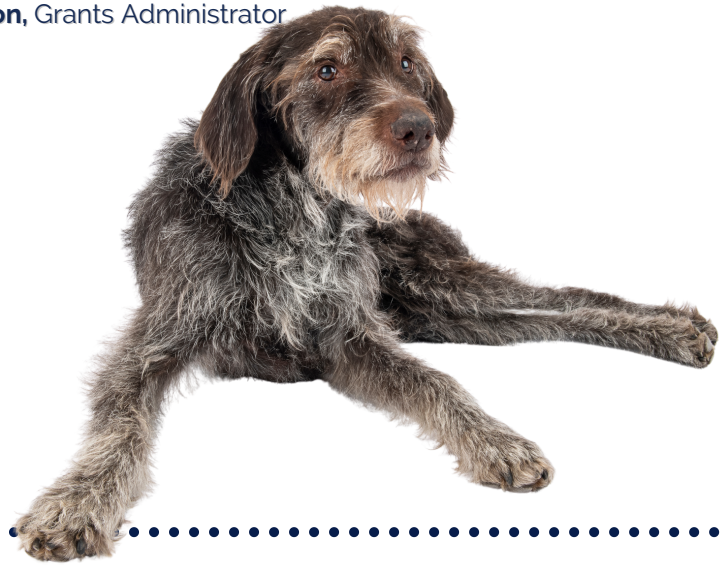
Denis Marcellin-Little, DEDV, Dip. ACVS, Dip. ACVSMR (Charter)
Dr. Marcellin-Little's primary research is on the pathophysiology, impact, and management of chronic pain and the use of digital tools (CAD software, 3D printing) to understand and manage complex orthopedic problems. His clinical focus is small animal orthopedic surgery, particularly the management of joint diseases and limb deformities. Dr. Marcellin-Little has a dog (Schipperke) and a cat.

Bruno Pypendop, DrMedVet, DrVetSci, Dip. ACVAA
Dr. Pypendop's core research is the clinical pharmacology of anesthetic and analgesic drugs, particularly in cats, with a clinical focus on anesthesia and pain management. He has four dogs, four cats, three horses, one donkey, eight chickens, two guinea pigs, and an undetermined number of freshwater fish.

Jodi Westropp, DVM, PhD, Dip. ACVIM
Dr. Westropp researches the use of novel antibiotic protocols as well as non-antibiotic therapies for canine UTI to help identify newer treatments for UTI and promote antimicrobial stewardship. In addition to UTI research, other ongoing studies include those related to the management of canine and feline calcium oxalate urolithiasis and other urinary stone disease. Dr. Westropp's sidekick is the (behaviorally challenged, but loveable) dog, "Clarence." She also has a few pasture pets including three Nigerian Dwarf Goats named Meg, Lois, and Audrey.

CCAH Administrative Team

- **Nancy Bei,** Center Manager
- **Lyra Pineda-Nelson,** Administrative Assistant
- **Helen Sutton,** Grants Administrator



Gunther Frederickson
Oncology

Ongoing Dog Research Studies

Faculty Research Support

68 Continuing Studies

20 New Studies

$1,683,330

Resident Research Support

18 Continuing Studies

1 New Study

$87,205

Hazel Knipe
Neurology/Neurosurgery

Newly Funded Research Studies

Blood Transfusion

Determination of the incidence of bacterial contamination in canine whole blood donations

Thousands of blood transfusions are given to dogs across the United States a year, and being able to collect blood from a donor that is free of bacteria is a key step in having safe blood products. In people, the initial sample of blood after the needle is placed into the vein is diverted into a separate collection bag, since this first portion of blood is more likely to contain bacteria. In the veterinary field there is no data on the rates of contamination of this initial portion of blood. The aim of this project is to investigate the incidence of bacterial contamination of the very first portion of blood collected from volunteer donors when a diversion arm is used to determine if its use can create a safer blood product.

Cancer

Comparison of 3-D versus 2-D imaging systems for laparoscopic adrenalectomy in dogs

For the past decade, adrenalectomy (surgical removal of the adrenal gland) in dogs has been performed with minimally invasive surgical techniques to treat cancer. As medical technology advances, greater refinements to surgical procedures can be realized, potentially offering significant advantages through reductions in complications and surgical time. Laparoscopic surgery is traditionally performed by observing the image from the surgical site viewed on a monitor in two dimensions (2D). Significant drawbacks of the 2D image include poor appreciation of depth perception and a lack of spatial awareness. Three-dimensional (3D) laparoscopy provides an appreciation of depth in the image and improves spatial awareness greatly. 3D laparoscopy is now available in veterinary medicine, and has been available for some time in human medicine where it provides the advantages of reducing complications, surgical time and blood loss associated with laparoscopic adrenalectomy. This study will compare 2D versus a 3D laparoscopic system for laparoscopic adrenalectomy in dogs to see if it improves our patients' outcomes.


Lilli Tell - Avian Medicine
and Human Food Safety

Cancer

Exploring the therapeutic potential of small molecule inhibitors of RBM38 for the treatment of canine osteosarcoma

Canine osteosarcoma (OSA) is the most common primary bone tumor in dogs, with more than 10,000 new cases a year. Currently, the treatment for dogs with OSA is amputation to remove the primary tumor, combined with chemotherapy. Despite an aggressive treatment approach, less than 50% of dogs live beyond one year, and more than 90% die from OSA by year two. Recently, we developed a drug called 094 that, when combined with chemotherapy, may help improve treatments. This project is an initial study to test 094.

Genomic landscape of primary canine mandibular osteosarcoma

Osteosarcoma (OSA) is the most common bone tumor in dogs. OSA arising from the lower jaw is less likely to spread than OSA arising from limb bones. Although OSA from the mandible or limb may look similar, variability in the spectrum of cancer-related changes in tumor DNA could contribute to these differences. This proposal aims at identifying the genomic landscape of canine OSA from the mandible by using a specialized DNA tool to help us better understand the genetic underpinnings and behavior of canine mandibular OSA to help us develop better treatments.

Dose escalation and associated toxicity profile of mechlorethamine in tumor bearing canine patients

Mechlorethamine is a chemotherapy drug used in the treatment of lymphoma in dogs that has commonly been used with two other chemotherapy drugs called vincristine and procarbazine. Mechlorethamine is given as an alternative treatment option to dogs who cannot receive the first-line chemotherapy drugs. While combination protocols with mechlorethamine have been used frequently in dogs diagnosed with lymphoma, the efficacy of this drug when used as a single agent is not known and its optimal dose is unknown. The purpose of this study is to determine the dose of mechlorethamine that can be administered safely in dogs diagnosed with any cancer, and improve efficacy in treating tumors in our dog patients.

Comparative transcriptomic analysis of olfactomedin like-3 mediated angiogenesis

Canine gliomas are a common and lethal brain tumor. Even with aggressive treatment, most dogs typically survive a mere 9-15 months after diagnosis. A key to tumor survival and progression is the formation of new blood vessels. Olfactomedin-like 3 (OLFML3) is a well-established protein that promotes new blood vessel formation in cancers outside of the brain. Compelling preliminary data from our laboratory indicates that OLFML3 may contribute to new blood vessel formation in glioma. This study will identify the changes in pathways following exposure to rhOLFML3 to help us advance our understanding of blood vessel formation in the canine brain and inform the development of improved therapeutic strategies for the treatment of canine glioma.

Feasibility of video-assisted mediastinoscopic lymphadenectomy in canine cadaveric specimens

The mediastinum within the chest contains normal structures such as the trachea, lymph nodes, and important nerves and blood vessels. Mediastinoscopy (a camera with a biopsy tool) is a minimally invasive technique used to biopsy lymph nodes and masses, providing critical information for decision-making in cancer therapy in people but not yet used in veterinary medicine. The objectives of this study are to evaluate the technical feasibility of mediastinoscopy in dogs utilizing two different techniques to provide valuable procedural information that may be subsequently applied to clinical patients, in order to maximize mediastinal evaluation with minimal morbidity in dogs.

Development and characterization of antibodies against canine TIGIT

TIGIT is an inhibitory receptor on lymphocytes that suppresses the immune system in human cancer patients. Blocking TIGIT may help make the body respond to cancers. The function of dog TIGIT remained largely uncharacterized due to lack of the tools to study the canine TIGIT pathway. In this proposal, we aim to generate several antibodies that recognize canine TIGIT, which can be used for routine basic and clinical research.

Cardiology

Whole genome association study of familial supraventricular arrhythmias in Labrador Retriever

Labrador retrievers are the most commonly identified dog breed to suffer from a rare form of heart rhythm disturbance known as supraventricular tachycardia (SVT), which is called Wolf-Parkinson-White syndrome in people. This arrhythmia is devastating and incredibly resistant to medical management, leaving many affected dogs to die suddenly, develop congestive heart failure or have dramatically reduced quality of life.The treatment of choice involves a specialized procedure (cardiac ablation) offered at only a handful of veterinary centers around the world and is often cost-prohibitive. Given the known familial nature of this condition we are seeking to first describe the pattern of inheritance for this disease and second use genetic sequencing to identify mutations that may cause this disease in Labradors, which would be used by breeders to reduce the incidence of this disease in breeding dogs and improve the health of one of the most popular dog breeds in North America.

Genetics (resident)

Association of fibrocartilaginous embolic myelopathy with the CFA 12-FGF4 retrogene in dogs

Obstruction of blood supply to the spinal cord results in a condition called ischemic myelopathy, with the most common cause being small pieces of fibrocartilage lodging within the blood vessels supplying the spinal cord. The underlying cause of this condition is unclear; however, very few definitively diagnosed cases of FCE have been reported in short-legged breeds. We plan to look at these cases and check whether they occur in short-legged dogs based on whether they were carrying the extra copy of the FGF4 gene, which may prevent this from happening. The results of this study will improve our understanding of FCE and help guide future studies to understand how FCE occurs.

Harry Korpita
Surgery

Genetics

Genome-wide association for susceptibility to vertebral malformation in Pug dogs

Malformed vertebrae occur commonly in certain dog breeds such as bulldogs, Boston terriers and pugs during development and can result in deformity of the spine that is present at birth and can lead to progressive paralysis. Surgical treatment is possible for some animals but outcome can be poor. The genetic cause has not yet been discovered in Pug dogs. We propose to investigate a group of affected and normal Pugs to try and determine genetic changes that may predispose Pugs to development of malformed vertebrae to allow for screening and selective breeding to remove the underlying cause of the disease.

Functional analysis of canine retrocopies

We have discovered a large number of a special new class of variant in dog DNA. They are called retrocopies and they occur when a complete copy of a gene is inserted into a new location on a different chromosome, and new sequencing techniques have allowed us to catalog the retrocopies within dogs. This project uses genomics sequencing techniques to investigate if the new gene copies are expressed and will investigate these to help identify causes of disease.

Hematology

Ex vivo heme-induced neutrophil extracellular traps in dogs

Dogs with immune-mediated hemolytic anemia (IMHA) are prone to clot formation which is the major cause of mortality. However, treatment options to prevent clot formation remains limited. In this study, we want to know if these toxic substances from ruptured red cells can activate a type of white blood cell to form neutrophil extracellular traps that can plug up blood vessels. We also want to know if these toxic substances can be scavenged by a protein called hemopexin, that can be eventually used to help dogs with IMHA. We hope that this study will be a step closer to finding effective treatments to improve survival of this devastating disease in dogs.

Infectious Disease

Use of a point-of-care assay to determine immune status for canine viral diseases

Historically, core vaccinations for canine parvovirus and distemper were recommended to be administered annually to triennially although immunity may last longer. The most recent guidelines recommend booster vaccines no more frequently than every three years to decrease risks of vaccine-associated side effects and recommend measuring antibody levels to see when a booster vaccine is necessary. Antibody measurements are labor-intensive, expensive, and have turnaround times of up to one week. Asking pet owners to consent to the cost of antibody monitoring and a second visit to a veterinary hospital should a booster vaccine be necessary creates barriers to optimal patient care. In this study, we evaluate a novel point-of-care diagnostic tool that can provide rapid antibody measurements and allow the clinician and client to determine the necessity of a booster vaccine in a single office visit to address these problems.

Identification of candidate antiviral drugs for canine distemper virus, using canine intestinal organoids

Canine distemper is a severe, often lethal viral disease. Vaccination for distemper is common but there is no effective treatment once a dog is infected. Some potential anti-CDV drugs have been identified but have not been tested in dogs. We will infect intestinal organoids (a new specialized cell culture) with distemper and test different concentrations of these drugs in order to see which drugs may be most effective to treat this viral disease.

Prevalence and method optimization for detecting Tritrichomonas infection in cats

Tritrichomonas is a parasite that occurs worldwide and can cause diarrhea occurring in kittens and young adult cats, often affecting those in shelters and rescue groups. This can lead to chronic diarrhea that affects the animals' well-being. The goal of this study is to provide a current understanding of the prevalence of Tritrichomonas infection in Northern California and establish a reliable laboratory test that can be offered for cat owners and shelter veterinarians.

The safety and effectiveness of oral itraconazole in young kittens with dermatophytosis

Ringworm is a common superficial fungal skin infection that is contagious and can spread to other animals and humans. Infected cats cannot be adopted and can be a source of contagion to other animals and in some shelters results in euthanasia. While there are treatments for ringworm in cats, little is known about oral antifungal medications in kittens. The purpose of this study is to evaluate the safety and efficacy of three treatment protocols for treating young kittens with ringworm, utilizing oral itraconazole and focal topical therapy.

Ophthalmology

The genetics and ocular microbiome of aqueous-deficient dry eye in West Highland White Terriers

Dry eye disease is a devastating disease in dogs where inadequate tear production can result in ulcers and even blindness. The most common cause in dogs is immune-mediated, whereby the dog's immune system attacks the tear-producing glands. However, the exact mechanism for how this process occurs is poorly understood. A variety of treatments exist but are often incompletely effective. Several dog breeds including West Highland White Terriers (WHWTs) are seen more commonly for ADDE in comparison to other breeds. This observation suggests that this disease may have a genetic component. We propose to identify the region of the dog genome associated with ADDE in WHWTs, and to develop a genetic test for ADDE in WHWTs. Also, there is increasing evidence that alterations in the normal microbes in our body can contribute to disease. We will collect a conjunctival swab from WHWTs with and without ADDE to investigate differences in the ocular microbiome to better understand this disease and to uncover new treatments.

"CCAH grants play a critical role in allowing UC Davis researchers to discover and test new treatment options for a variety of diseases in dogs and cats."

Dr. Luke Wittenburg D.V.M., Ph.D, DACVCP
Associate Professor

Respiratory

Evaluation of surgical approaches to brachycephalic obstructive airway syndrome in French Bulldogs

Brachycephalic obstructive airway syndrome (BOAS) is a condition of short-nosed dogs that can lead to severe respiratory compromise and is caused by multiple anatomical abnormalities, including narrowing of the nasal openings, elongation of the soft palate, abnormal larynx anatomy, and sometimes narrowing of the trachea. Surgery is aimed at repairing these but is not always effective. A new procedure called folded flap palatoplasty, could provide greater relief. The aims of the study are to compare these two surgical approaches and see if this new procedure will improve outcomes.

Stem Cell

Identification and characterization of canine skeletal stem cells

Articular cartilage has poor regenerative capacity and its loss leads to arthritis. In order to regenerate cartilage or bone, specific stem cells with the ability to generate tissues have to be selected from the general stromal cell pool. In this study, we outline the strategy for identifying specific cell surface markers in dogs utilizing established single-cell RNA-sequencing that will allow the purification of these cells. We will then isolate canine cartilage progenitor cells and study their behavior in laboratory conditions to help us eventually come up with treatments for damaged cartilage.

Urinary

Plasma and urinary amino acid contractions in androgen-dependent cystinuric dogs

Cystine is an amino acid that is filtered and then reabsorbed by the kidney. When this re-absorption is hampered, cystine can accumulate in the urine and predispose the dog to bladder and kidney stones. The cornerstone of management for cystine urolithiasis has been a special diet. While medications that prevent cystine formation are available, they are expensive, have side effects, and are not very effective. An androgen-dependent cystinuria has been recently reported in intact male dogs where neutering can cure this disease. However, no data regarding urinary amino acid concentrations has been reported. Therefore we are evaluating these before and after castration to provide evidence for what management strategies should be recommended.

Training the next generation of researchers

The CCAH is providing matching funds, which has helped us obtain a grant from the National Cancer Institute. The T32 grant will train DVM students, MDs, and DVMs to study animal cancer and how it relates to human cancer in order to benefit both species.

Tess Larsen
Nutrition

Ongoing Cat Research Studies

Faculty Research Support

30 Continuing Studies	7 New Studies

$954,151

Resident Research Support

2 Continuing Studies	0 New Studies

$9,742

Meeko West
Retired

Newly Funded Research Studies

Anesthesia

Cardiovascular effects of intravenous butorphanol infusions in isoflurane-anesthetized cats

Anesthesia in cats has a higher risk of causing injury or death than other animals and may be due in part to decrease in blood pressure caused by anesthetic drugs. In dogs and humans, opioids are commonly used to decrease the dose of anesthetic drugs and improve cardiovascular function, including blood pressure, but have not worked in cats to date. Promising preliminary results using butorphanol in cats suggest this drug may help and needs to be further investigated, which this study will do to try to reduce the risk of anesthesia.

Effects of buprenorphine infusion on isoflurane minimum alveolar concentration in cats

Again to address the increased risk cats have when undergoing anesthesia, this study will further study buprenorphine to see if continuous administration will decrease the amount of anesthetic gas needed while protecting from decreased blood pressure.

Cancer

Predicting early treatment failure in feline nasal lymphoma treated with radiation therapy

Nasal lymphoma is a common cancer in cats. Cats with nasal lymphoma are commonly treated with radiation therapy (RT) and can live for extended periods of time although about a quarter of cats will experience early progression and succumb to the disease within a year. This study proposes to determine if nasal tissue samples can be used to predict if cats will have early therapy failure following treatment, with the goal to provide better treatment for this type of cancer.

Huckle Skorupski
Oncology

Ongoing Cat Research Studies continued

Dental Disease

Nanoparticulate enhancement of feline mesenchymal stromal cells for immunomodulation

Many cats suffer from gingivostomatitis (inflammation of gums and mouth), resulting in severe oral pain, inability to eat, drink, and groom, causing a great deal of distress and frustration to cats and their owners. The treatments currently available include extraction of all or a majority of teeth, which does not always work, requiring lifelong administration of antibiotics and steroids. A breakthrough clinical study at UC Davis discovered that refractory gingivostomatitis could be cured with two consequent injections of fat-derived stem cells. Dozens of cats were cured, but some cats did not respond as well. We will enhance allogeneic stem cells' function by 'coating' them with nanoparticles (NPs) carrying Adenosine, which is a potent immunomodulatory compound that should help direct them to the affected mouth. We hope this will improve treatment for these cats who do not otherwise respond.

Fracture Repair

Biomechanical evaluation of L malleable miniplates for challenging mandibular fractures in cats

Mandibular fractures due to head trauma in cats may require surgical bone repair. Failure of the jaw repair or corresponding complications can occur when bone quality is poor or mechanical strength of the fixation is unfavorable. Better plates are needed for cats, and titanium mini plates may restore normal function of the jaw (the ability to eat and drink), and restore shape and appearance. This study will help evaluate two different types of plates to see which one works best.

Gastrointestinal Disease

Role of intestinal microbiome and evaluation of fecal microbiota transplantation efficacy in kittens

Diarrhea is a leading cause of suffering and even death in kittens and young cats. While many kittens respond to treatment, some continue to have diarrhea. Gastrointestinal diseases are often associated with disturbances of the intestine microbiome (the normal gut bacteria). Fecal microbiota transplantation (FMT),where a healthy donor's stool is transplanted to an individual with gut disease, may be able to restore a healthy microbiome and ameliorate clinical signs, and this study will investigate this in kittens with therapy-resistant diarrhea.

Infectious Disease

Pharmacokinetics of isavuconazole in healthy cats

Fungal infections in cats can be life-threatening and treatment is hindered by side effects of current antifungal medications. Isavuconazole is a new antifungal used in people that kills a wide range of fungal organisms, including many that affect cats, and isavuconazole may prove to be a fantastic antifungal for use in cats. There have been no studies looking at its use in cats to date. This study aims to identify drug characteristics of isavuconazole when given to cats both orally and intravenously so it can be used for the treatment of fungal infections.

"My research group has been hard at work in the laboratory throughout the coronavirus pandemic and have identified several different drug compounds that kill the virus that causes FIP. We are gearing up for clinical trials to test these drugs in client-owned cats with FIP. FIP is no longer the death sentence it once was; it has become a treatable disease."

Dr. Brian Murphy, DVM, PhD, Dip. ACVP

Professor

Sarah Sutton
CCAH

Ongoing Multi-Species & Other Companion Animal Research Studies

Faculty Research Support

8 Continuing Studies	6 New Studies

$254,719

Resident Research Support

5 Continuing Studies	1 New Study

$29,684

Tina Turner Sears Oncology

Newly Funded Research Studies

Artificial Intelligence

Integrating artificial intelligence into clinical decision making

Artificial intelligence (AI) has the potential to fundamentally transform veterinary medicine using big data to help clinicians diagnose disease, predict outcome and plan treatments. AI complements the training and experience of a human with comprehensive, data-based information. UC Davis has an active community of researchers that develops AI-based applications to support various aspects of the diagnostic process. We need to build the computational infrastructure to connect these new applications with the existing medical records database system. To address this problem, we have developed an animal health data analytics platform to do this but need the additional resources for testing and implementation.

Infectious Disease

Development of prophylactic methods against piscine mycobacteriosis in pet fish

Aquarium fish are the most common companion animal in America with over 158 million fish kept in over 15 million households. Despite this, there is minimal veterinary care for pet fish, and large numbers die due to poor husbandry and disease. Mycobacterium are bacteria causing disease in both aquatic and land animals. Mycobacteriosis have caused outbreaks resulting in considerable losses of fish, and there are no vaccines or efficacious treatments for use in fish. This study will help development of a vaccine against this disease.

Infectious Disease (resident)

Phenotypic and genotypic characteristics of extended-spectrum beta-lactamase-producing bacteria

Emerging antimicrobial resistance is a concern in human and veterinary medicine and can lead to treatment failure, particularly for extended-spectrum beta-lactamase (ESBL)-producing bacteria that neutralize antibiotics. Infections caused by ESBL-producing bacteria are increasingly being recognized in human medicine, however little is known about the clinical presentation, genetic code, or outcome in dogs and cats infected with ESBL-producing bacteria. This study will characterize these characteristics in our patients and look at the bacterial strains responsible for infection to optimize treatment.

Alberto Rodriguez - Exotic Animal Medicine & Surgery

Ongoing Multi-Species & Other Companion Animal Research Studies continued

Pain Control

Pharmacokinetic parameters and efficacy of a liposomal bupivacaine formulation in goats

Goats are becoming more popular as pets. Lidocaine has been used to provide pain relief during painful procedures but has a short duration (~1 hour) of activity. Alternatively, liposomal bupivacaine may provide prolonged analgesia (up to 72 hours) but there is no safety, pharmacokinetic (PK) or efficacy data for this drug in goats; this study aims to fill that knowledge gap and develop better pain management strategies for this species.

Renal

Trace minerals content in uroliths from goats and pigs with urolithiasis

Urinary flow blockage (urolithiasis) due to presence of stones in the urinary passage is a life-threatening, frustrating disease with steep costs for treatment and the high likelihood of recurrence. In these large animal companions hundreds of cases are seen a year at our hospital alone and risk factors are poorly understood. Owners routinely supplement trace minerals such as copper and selenium in goats and pigs. Trace minerals have been identified to play a critical role in stone formation in other species, including humans, and could influence stone formation. The objectives of this study are to measure and compare the content of trace minerals in urinary stones from goats and pigs, and investigate risk factors for developing urine stones to guide recommendations for dietary management, supplementation of trace minerals, and the expansion of laboratory urinary stone analyses to include trace minerals to better manage this disease.

Respiratory

Comparison of tracheal wash and bronchoalveolar lavage in dogs & cats with lower respiratory disease

There are various reasons for a cat or dog to develop a chronic cough and/or lower respiratory disease, such as pneumonia, airway collapse, bronchitis, heartworm disease, and cancer. One of the common diagnostic procedures performed to obtain a diagnosis is bronchoscopy of the lungs to inspect the inner airways of the lungs using an endoscope and to collect fluid samples for analysis. In general practice, bronchoscopy is not typically available; however, a simpler procedure called a tracheal wash can be performed. Our study will prospectively compare and contrast fluid samples obtained by tracheal wash versus bronchoscopy and BAL in client-owned dogs and cats with lower respiratory disease to see which is better at diagnosing disease.

SARS-CoV-2

Prevalence and risk assessment of SARS-CoV-2 in companion animals

Growing scientific evidence shows that dogs, and especially cats, are susceptible to SARS-CoV-2 (COVID-19). Several studies suggested that following infection dogs do not shed virus or spread it via respiratory droplets, but do develop immune response to SARS-CoV-2. Unlike dogs, cats are highly susceptible to SARS-CoV-2 infection. Although it does not seem to cause clinical disease in cats, they might be able to spread the disease. We have developed a PCR tests for cats and will investigate the role and the frequency of SARS-CoV-2 in healthy and sick dogs and cats to help develop guidelines to stop viral spread.

CALIFORNIA FOR ALL ANIMALS

January 2022

Coming to an animal shelter near you

A Promise Kept: UC Davis Koret Shelter Medicine Program to lead a 50 million-dollar statewide project to provide resources and training to California animal shelters

While running for governor, Gavin Newsom made a promise to all Californians and to the over 100,000 shelter animals still euthanized annually:

We will ensure that all California communities have the resources they need to meet the state's goal that no healthy or treatable dog or cat is euthanized in an animal shelter.

Despite there being a two-decade-old state policy stating no adoptable or treatable dog or cat be euthanized, California is second only to Texas in the number of animals dying in shelters. The state stopped reimbursing local governments for some animal shelter costs during the recession and many communities have struggled to meet the goal ever since.

The Governor made good on his promise when he earmarked 50 million dollars to be distributed to California animal shelters through targeted grants over a five-year span and tapped the UC Davis Koret Shelter Medicine Program (KSMP) to lead the charge.

Beginning in January 2022, California for All Animals, the first state-funded program in California's history aimed at addressing resource disparities and closing the lifesaving gap, will offer its first round of grants. Shelters enrolling in the program will have access to

- Prioritized investment and direct professional engagement with animal shelters in under-resourced and overburdened communities
- Regional best-practice summits open to all animal sheltering personnel
- Access to the most current research and shelter management models available, as well as the subject matter experts who pioneered the veterinary medicine field that concentrates on the health and well-being of animals living in shelters
- Interactive group training that guarantees shelters have access to best-practice protocols and models
- Robust resource library complete with sample forms, protocols, case studies, policies and tool kits

Research Equipment Support

Research made possible thanks to the support of our donors:

21 Projects funded in FY 2020-2021

$358,825

Pressure measurement system for joints and surgical implant fragment fixation (Tekscan K-Scan System)
Principal Investigator: Susan Stover
This equipment is used to improve the standard of care and research in fracture healing.

Repair of Mettler Toledo-New Classic ME Analytical Balance
Principal Investigator: Valerie Wiebe
This machine is used to develop compound pharmaceutical capsules and weigh product accurately for various species.

Compact Touch Ultrasound Biomicroscope
Principal Investigator: Kathryn Koehler
Ultrasound biomicroscopy (UBM) system will allow us to study the accuracy in pre-operatively assessing depth of corneal lesions, report the invasiveness of different ocular neoplasms, and evaluate the anterior segment in eyes with corneal disease severe enough to inhibit intraocular examination.

VikingQuest Electrodiagnostic Machine
Principal Investigator: Marguerite Knipe
An EMG machine records and analyzes the electrical activity in muscles. It is used to learn more about the functioning of nerves in the limbs of pets.

Q125 Sonicator, vortex mixer with multi-sample attachment, pipette controller, Multichannel pipettor (10-100 uL), Multichannel pipettor (20-100 uL)
Principal Investigator: Luke Wittenburg
The Q125 Sonicator is used for multiple purposes including research projects requiring western blot, RNA or chromatin immunoprecipitation. Applications include standard cell disruption, DNA/RNA shearing and homogenization. The Vortex Mixer with multi-sample holder is used for sample preparation for pharmacokinetic studies where drug extraction requires vortex mixing of multiple samples at a time for extended periods. The stripettor/pipette controller is used for liquid handling in tissue culture and benchtop laboratory procedures.

Portable handheld ultrasound machine (C3 HD Vet - Convex Scanner)
Principal Investigator: Munashe Chigerwe
The portable, hand-held, ultrasound machine is used to diagnose common disease conditions, monitor, and perform clinical research, and improves patient welfare by allowing ultrasonographic imaging without needing to disconnect medications such as intravenous fluids and reducing stress associated with transporting animals to examination rooms.

Nitrogen storage vessel and accessories; dry ice chest
Principal Investigator: Michelle Giuffrida
The nitrogen storage vessel and dry ice chest provide the ultra-low temperature equipment required to properly store and ship biological samples collected as part of clinical trials research at UC Davis School of Veterinary Medicine. The research studies are aimed at evaluating new therapies and vaccines to combat cancer and other diseases in companion animals.

Meeko West
Retired

Odyssey 30 Holmium Laser System
Principal Investigator: Jodi Westropp
A wide-range of minimally invasive therapeutic procedures can be achieved on multiple species with this updated laser system.

Electrochemotherapy Unit
Principal Investigator: Amandine Lejeune
Electrochemotherapy increases the absorbency of tumor cells, thereby intensifying the concentration of drugs delivered to targeted areas.

5810R Eppendorf Centrifuge
Principal Investigator: Amir Kol
The updated centrifuge is used for research on stem cell cultures, including the study of infectious diseases.

Non-Coherent Light Source for Photodynamic Therapy
Principal Investigator: Bianca Da Costa Martins
Photodynamic therapy offers a minimally invasive and cost-effective alternative to laser therapy in the treatment of superficial tumors.

Anesthesia Machine
Principal Investigator: Bruno Pypendop
This new machine replaces old technology to improve research on the use of anesthesia on dogs and cats.

Software for force plate system (Qualisys)
Principal Investigator: Denis Marcellin-Little
This 3D software system replaces old technology for improved kinetic and gait analyses in dogs.

Replacement refrigerator, cell viability counter, and homogenizer
Principal Investigator: Jin Zhang
The cell viability counter and homogenizer is used for state-of-the-art technologies including single-cell sequencing in multiple species.

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FLIR E96 - Advanced Thermal Camera
Principal Investigator: Joanne Paul-Murphy
The increased resolution of this FLIR E96 hand-held camera allows for better assessment and treatment of inflammation and thermal abnormalities in small species.

Sonoriste Veterinary Edge II Ultrasound System
Principal Investigator: Amandeep Chohan
The Edge II ultrasound is used to apply guided nerve block techniques for treating companion animals, a practice that is the standard of care in human medicine.

Flex Dex
Principal Investigator: William Culp
The Flex Dex is an articulated, minimally invasive instrument allowing the user to perform robotic-like surgery leading to decreased pain and shorter recovery for companion animals.

Repair of ProteinSimple FluorChem E Digital Darkroom Imager
Principal Investigator: Kevin Woolard
Repair of imager used to routinely visualize western blots, nucleic acid gels, and perform bacterial or cell colony counts.

Water bath, refrigerated centrifuge, vortexes, pipettes
Principal Investigator: Robert Rebhun
This grant replaces existing shared equipment in the core oncology laboratory, and the VMTH VCCT trials coordinators for processing and storage of clinical trials samples. This equipment is also used for routine banking of tumor and correlative tissues.

Air Science Purair RX USP 800 Compliant Ductless Fume Hood
Principal Investigator: Steven Epstein
This equipment complies with new laws related to the modification of drugs for use in research. It also serves to increase safety for the individuals developing the research drugs.

Reptile Caging System
Principal Investigator: David Guzman
The new cages allow for individualized heat and lighting which is critical for behavioral thermoregulation in reptiles.

Strawberry Cullen
ER/ICU

Research Publications

Analgesia / Pain Control

Pharmacokinetics of a high-concentration formulation of buprenorphine (Simbadol) in male dogs

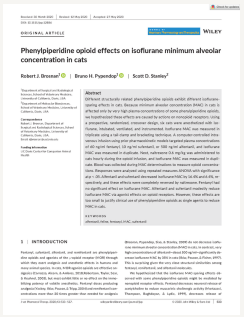
Veterinary Anaesthesia and Analgesia
(July 2021)
Hansford J, Henao-Guerrero N, Machado ML, Pypendop BH

Comparison of the efficacy and duration of desensitization of oral structures following injection of a lidocaine-bupivacaine mixture via lateral percutaneous and modified infraorbital approaches in dogs

American Journal of Veterinary Research
(January 2021)
Chohan AS, Pascoe PJ

Pharmacokinetics of hydromorphone hydrochloride after intramuscular and intravenous administration of a single dose to orange-winged Amazon parrots (Amazona amazonica)

American Journal of Veterinary Medicine
(November 2020)
Sanchez-Migallon Guzman D, Knych H, Douglas J, Paul-Murphy JR

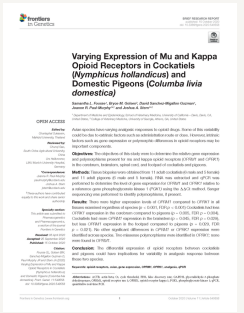


Phenylpiperidine opioid effects on isoflurane minimum alveolar concentration in cats

Journal of Veterinary Pharmacology and Therapeutics
(November 2020)
Brosnan RJ, Pypendop BH, Stanley SD

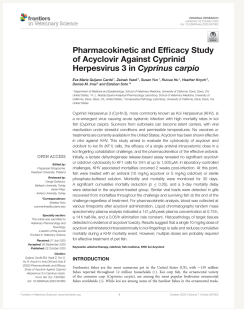
Evaluation of the thermal antinociceptive effects of hydromorphone hydrochloride after intramuscular administration to orange-winged Amazon parrots (Amazona amazonica)

American Journal of Veterinary Medicine
(October 2020)
Sanchez-Migallon Guzman D, Douglas JM, Beaufrère H, Paul-Murphy JR



Varying Expression of Mu and Kappa Opioid Receptors in Cockatiels (Nymphicus hollandicus) and Domestic Pigeons (Columba livia domestica)

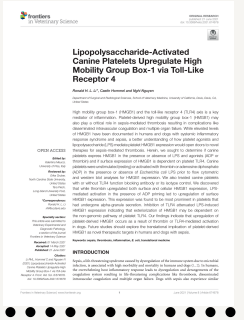
Frontiers in Genetics
(October 2020)
Fousse SL, Golsen BM, Sanchez-Migallon Guzman D, Paul-Murphy JR, Stern JA



Pharmacokinetic and Efficacy Study of Acyclovir Against Cyprinid Herpesvirus 3 in Cyprinus carpio

Frontiers in Veterinary Science
(October 2020)
Quijano Cardé EM, Yazdi Z, Yun S, Hu R, Knych H, Imai DM, Soto E

Blood Clotting



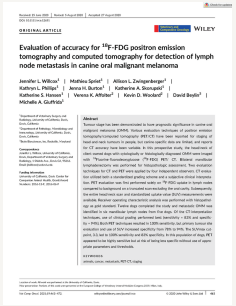
Lipopolysaccharide-Activated Canine Platelets Upregulate High Mobility Group Box-1 via Toll-Like Receptor 4

Frontiers in Veterinary Science
(June 2021)
Li RHL, Hommel C, Nguyen N

Cancer

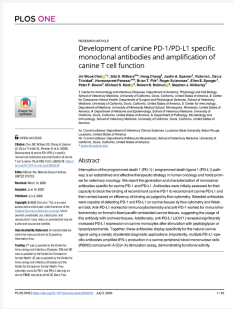
Glioma-associated microglia / macrophages augment tumorigenicity in canine astrocytoma, a naturally occurring model of human glioma

Neuro-Oncology Advances
(May 2021)
Toedebusch R, Grodzki AC, Dickinson PJ, Woolard K, Vinson N, Sturges B, Snyder J, Li CF, Nagasaka O, Consales B, Vernau K, Knipe M, Murthy V, Lein PJ, Toedebusch CM



Evaluation of accuracy for 18F-FDG positron emission tomography and computed tomography for detection of lymph node metastasis in canine oral malignant melanoma

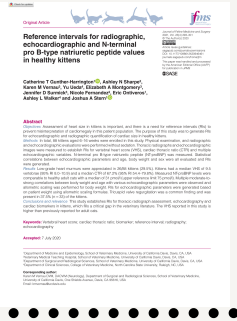
Veterinary and Comparative Oncology
(August 2020)
Willcox JL, Spriet M, Zwingenberger AL, Phillips KL, Burton JH, Skorupski KA, Hansen KS, Affolter VK, Woolard KD, Beylin D, Giuffrida MA



Development of canine PD-1/PD-L1 specific monoclonal antibodies and amplification of canine T cell function

PLOS ONE
(July 2020)
Choi JW, Withers SS, Chang H, Spanier JA, De La Trinidad VL, Panesar H, Fife BT, Sciammas R, Sparger EE, Moore PF, Kent MS, Rebhun RB, McSorley SJ

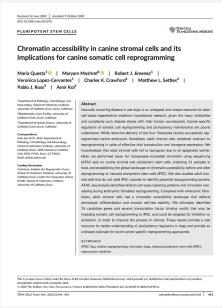
Cardiology



Reference intervals for radiographic, echocardiographic and N-terminal pro B-type natriuretic peptide values in healthy kittens

Journal of Feline Medicine and Surgery
(April 2021)
Gunther-Harrington CT, Sharpe AN, Vernau KM, Ueda Y, Montgomery EA, Surmick JD, Fernandez N, Ontiveros E, Walker AL, Stern JA

Genetics



Chromatin accessibility in canine stromal cells and its implications for canine somatic cell reprogramming

Stem Cells Translational Medicine
(November 2020)
Questa M, Moshref M, Jimenez RJ, Lopez-Cervantes V, Crawford CK, Settles ML, Ross PJ, Kol A

A Missense Variant in ALDH5A1 Associated with Canine Succinic Semialdehyde Dehydrogenase Deficiency (SSADHD) in the Saluki Dog

Genes 2020
(September 2020)
Vernau KM, Struys E, Letko A, Woolard KD, Aguilar M, Brown EA, Cissell DD, Dickinson PJ, Shelton GD, Broome MR, Gibson KM, Pearl PL, König F, Van Winkle TJ, O'Brien D, Roos B, Matiasek K, Jagannathan V, Drögemüller C, Mansour TA, Brown CT, Bannasch DL

Infectious Disease

Pharmacokinetics of amantadine after oral administration of single and multiple doses to orange-winged Amazon parrots (Amazona amazonica)

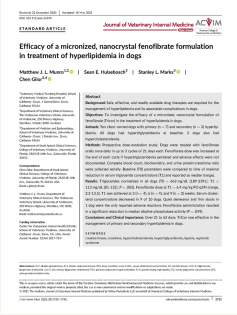
American Journal of Veterinary Medicine
(August 2020)
Berg KJ, Sanchez-Migallon Guzman D, Knych HK, Drazenovich TL, Paul-Murphy JR

Dentistry

Stem cell therapy prior to full-mouth tooth extraction lacks substantial clinical efficacy in cats affected by chronic gingivostomatitis

Journal of Feline Medicine and Surgery
(September 2020)
Arzi B, Taechangam N, Lommer MJ, Walker NJ, Loscar MR, Borjesson DL

Internal Medicine



Efficacy of a micronized, nanocrystal fenofibrate formulation in treatment of hyperlipidemia in dogs

Journal of Veterinary Internal Medicine
(July 2021)
Munro MJL, Hulsebosch SE, Marks SL, Gilor C

Diabetes

Loss of sympathetic innervation to islets of Langerhans in canine diabetes and pancreatitis is not associated with insulitis

Nature Research
(November 2020)
Gilor C, Pires J, Greathouse R, Horn R, Huising MO, Marks SL, Murphy B, Kol A

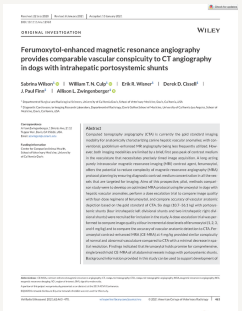
Multiple FGF4 Retrocopies Recently Derived within Canids

Genes 2020
(July 2020)
Batcher K, Dickinson P, Maciejczyk K, Brzeski K, Rasouliha SH, Letko A, Drögemüller C, Leeb T, Bannasch D

Quality of DNA extracted from formalinfixed, paraffin-embedded canine tissues

Journal of Veterinary Diagnostic Investigation
(July 2020)
Dear JD, Sykes JE, Bannasch DL

Liver Disease

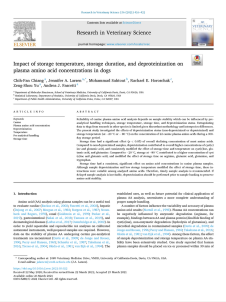


Ferumoxytol-enhanced magnetic resonance angiography provides comparable vascular conspicuity to CT angiography in dogs with intrahepatic portosystemic shunts

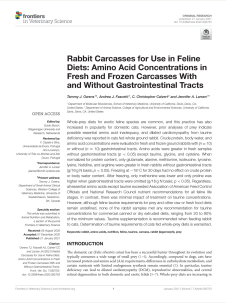
Veterinary Radiology and Ultrasound
(July 2021)
Wilson S, Culp WTN, Wisner ER, Cissell DD, Finn JP, Zwingenberger AL

Research Publications continued

Nutrition



Impact of storage temperature, storage duration, and deproteinization on plasma amino acid concentrations in dogs
Research in Veterinary Science
(March 2021)
Chiang C, Larsen JA, Sahtout M, Horoschak RE, Yu Z, Fascetti AJ

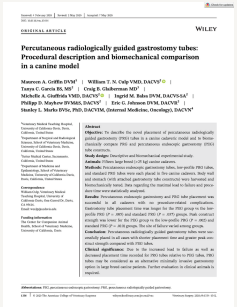


Rabbit Carcasses for Use in Feline Diets: Amino Acid Concentrations in Fresh and Frozen Carcasses With and Without Gastrointestinal Tracts
Frontiers in Veterinary Science
(January 2021)
Owens TJ, Fascetti AJ, Calvert CC, Larsen JA

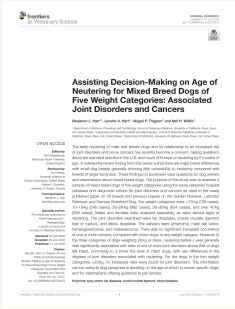
Surgery

Influence of interlocking thread screws to repair simulated adult canine humeral condylar fractures
Veterinary Surgery
(August 2021)
Raleigh JS, Filliquist B, Kapatkin AS, Chou PY, Marcellin-Little DJ, Garcia TC, Jacques KL, Stover SM

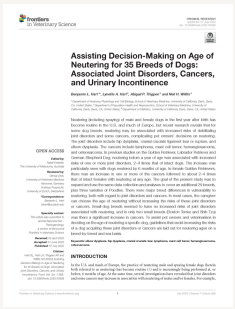
A randomized controlled trial of three-dimensional versus two-dimensional imaging system on duration of surgery and mental workload for laparoscopic gastropexies in dogs
Veterinary Surgery
(July 2021)
Balsa IM, Giuffrida MA, Mayhew PD



Percutaneous radiologically guided gastrostomy tubes: Procedural description and biomechanical comparison in a canine model
Veterinary Surgery
(October 2020)
Griffin MA, Culp WTN, Garcia TC, Glaiberman CB, Giuffrida MA, Balsa IM, Mayhew PD, Johnson EG, Marks SL



Assisting Decision-Making on Age of Neutering for Mixed Breed Dogs of Five Weight Categories: Associated Joint Disorders and Cancers
Frontiers in Veterinary Science
(July 2020)
Hart BL, Hart LA, Thigpen AP, Willits NH



Assisting Decision-Making on Age of Neutering for 35 Breeds of Dogs: Associated Joint Disorders, Cancers, and Urinary Incontinence
Frontiers in Veterinary Science
(July 2020)
Hart BL, Hart LA, Thigpen AP, Willits NH

Surgery - Orthopedics

Comparison of needle arthroscopy, traditional arthroscopy, and computed tomography for the evaluation of medial coronoid disease in the canine elbow
Veterinary Surgery
(July 2021)
Hersh-Boyle RA, Chou PY, Kapatkin AS, Spriet M, Filliquist B, Garcia TC, Marcellin-Little DJ

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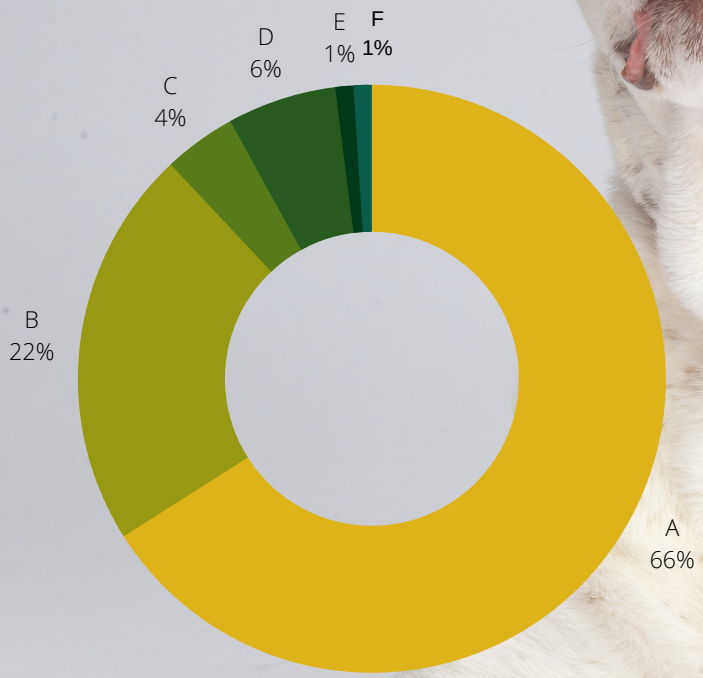
CCAH donor-funded studies resulted in publications: FY2020-2021

*If you are interested in reading any of the publications listed, please contact the CCAH at 530-752-7295.

Ripley Delany
Shelter Medicine

CCAH Funding at a Glance



(July 1, 2020 - June 30, 2021)

A. Faculty Research Support		**$1,103,056 (66%)**
B. Faculty Equipment Support		**$358,825 (22%)**
C. Resident Research Support		**$72,727 (4%)**
D. Program Support	(Radiation Oncology Bootcamp, Population Control, All Species Imaging, Veterinary Center for Clinical Trials)	**$103,665 (6%)**
E. Student Research Support		**$12,660 (1%)**
F. Laboratory / Building Support		**$10,737 (1%)**

Since 1991 the CCAH has supported companion animal research by funding over $27 million in studies

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