

EveryCAT

HEALTH FOUNDATION

The Future of Feline Medicine Starts Here

2022/2023 Research Update

2023 EveryCat Health Foundation Grant Awards
2022 Miller Trust Grant Awards
2022-2023 CaP-K Grant Awards



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2023 EveryCat Health Foundation Grant Awards

Total Awarded \$316,530

EC23-009 Use of the DNA damage response inhibitor BAY 1895344 as a component of care in feline oral squamous cell carcinoma. PI: Michael Nolan, North Carolina State University; Yvonne Mowery, Duke University. \$32,000

Oral Squamous Cell Carcinoma is an aggressive cancer of cats that is poorly responsive to modern therapies. Radiation therapy may be enhanced by the addition of drugs that inhibit DNA repair. This study investigates the use of a DNA repair inhibitor in cats with oral squamous cell carcinoma undergoing radiation therapy. *(Oncology Fund)*

EC23-012 Preventing severe adverse drug reactions in every cat by assessing the P-glycoprotein substrate status of clinically important drugs. PI: Katrina Mealey, Washington State University. \$21,260

P-glycoprotein protects the brain and other tissues from the harmful effects of certain drugs in dogs, mutations in PGP can lead to toxic effects from "normal" doses of drugs in some breeds. PGP mutations also exist in cats, but it is unclear which drugs are affected. This study aims to determine what drugs may have increased toxicity in cats with PGP mutations. *(Sponsored by Zoetis)*

EC23-019 Effect of inhaled albuterol on whole blood potassium concentrations in healthy cats. PI: Elizabeth O'Toole, Jo-Annie Letendre; Université de Montréal \$7,648

High potassium levels occur commonly in cats with obstructed urinary tracts and are often life threatening. In humans and in dogs, inhaled albuterol can be used to temporarily decrease potassium levels, allowing stabilization until obstruction is relieved. This study aims to determine if this is also effective in cats.

EC23-034 Molecular characterization of feline fibrosarcomas using spatially defined proteomics and transcriptomics. PI: Enni Markkanen, University of Zurich \$35,000

Feline fibrosarcoma is an aggressive and locally invasive cancer that is difficult to fully remove and does not respond well to chemotherapy. This study aims to use analysis of proteins and RNA in tumor samples and compare them to surrounding healthy tissue to help aid in removing tumors entirely and to define targets for possible chemotherapies. *(Sponsored by Zoetis)*

EC23-041 Development of a Machine Learning Algorithm for Diagnosis of Feline Infectious Peritonitis. Samantha J.M. Evans, The Ohio State University; Krystle L. Reagan, University of California- Davis, \$14,030

Despite recent advances, FIP remains a challenging disease to diagnose, especially in the "dry" form. As such, it is often not even suspected on basic bloodwork analysis. Subtle trends may be present that are suggestive of FIP but may be missed by humans. This study aims to use machine learning to determine if patterns of results are present that may be suggestive of FIP. *(Bria Fund)*

EC23-043 Molecular characteristics and clinical outcomes of uropathogenic *Escherichia coli* in aging cats.

PI: Erin Frey, North Carolina State University, \$34,919

Older cats are more prone to develop urinary tract infections. Some strains of *E. coli* are more likely to cause recurrent or difficult to treat infections than others. This study investigates the genetic and molecular findings that make some types of *E. coli* more serious infections than others.

EC23-047 Feline FAANG: what makes a cat – a cat! PI: Leslie A. Lyons, University of Missouri, \$33,738

Domestic cats have one of the most complete genome sequences of any species, however many diseases with known genetic origins do not have their specific genes or mutations identified. This study is a continuation of previous research aimed at finding the genetic basis for many common feline conditions. *(Miller Trust Fund)*

EC23-060 Assessment of phage therapy in cats: a solution for antibiotic-resistant infections. PI: Ronen Hazan, The Hebrew University, Jerusalem; Alin Barsheshet, Vet-Holim JVMC Veterinary Medical Center, Kiryat Anavim, Israel. \$34,000

Resistant bacterial infections are a common and increasing cause of concern in veterinary medicine. Phage therapy uses viruses to infect and kill bacteria without the need for antibiotics. This study aims to investigate and develop phages to treat resistant infections in cats. *(Sponsored by Zoetis)*

EC23-069 Urinary active transforming growth factor beta 1 in cats with hyperthyroidism before and after radioiodine treatment. PI: Laura Perez Lopez, Sylvie Daminet, Ghent University \$35,000

Radio-iodine therapy is the gold standard for the treatment of hyperthyroidism. However, many cats may have "unmasking" of their kidney disease after therapy. This study aims to investigate the concentrations of Transforming Growth Factor-beta in cat urine to determine if this predicts the risk of kidney disease after I-131. *[Kidney Disease Fund in honor of Vicki Thayer, DVM, DABVP (Feline)]*

EC23-074 Identification of the receptor allowing feline coronavirus type I entry into its natural target cell, the enterocyte. PI: Hans Nauwynck, Ghent University \$34,250

This study investigates how Feline Enteric Coronavirus (the precursor to FIP) enters intestinal cells. Finding this out may allow for the development of vaccines or drugs to prevent or treat infection before it becomes FIP. It will also allow the development of cell cultures that can be infected with coronavirus, allowing easier FIP research. *(Bria Fund)*

EC23-076 Assessing Pharmacokinetics of the Novel Antiseizure Medication Brivaracetam in Healthy Cats.

PI: Amanda Gross, Tom Jukier; Auburn University, \$34,685

This study investigates the ideal dose and frequency of administration of a new medication to treat and prevent seizures in cats. This medication may have fewer adverse effects and easier administration schedules than drugs currently on the market.

2022 George Sydney and Phyllis Redmond Miller Trust Grant Awards
Total Awarded \$199,546

MT22-019: "Curbing FIP by targeting and blocking the viral ion channels." Principal Investigator(s): Gary Whittaker; Isiah Arkin, Cornell University. \$34,962

(MT22-019 continued) FIP and COVID are closely related coronaviruses, and many drugs can be used to treat both diseases. This study leverages the strengths of a well-known human lab studying COVID with a premier veterinary lab at the forefront of FIP research to discover novel drugs that inhibit the virus' ion channels, which regulate infectivity, to develop new therapeutic drug combinations.

MT22-020: "Establishment of feline keratinocyte organoids and use as a model to study feline

dermatophytosis." Principal Investigator(s): Dominique Wiener, Texas A&M University. \$35,000

Ringworm is a common fungal skin infection of cats that is not well understood. But infecting cats to study this disease is not ideal. This study will develop skin "organoids" from feline skin stem cells to enable researchers to study this disease without the use of research cats.

MT22-021: "Immediate Intervention Following Tooth Extraction Using Allogeneic Adipose-Derived Mesenchymal Stem Cell Therapy for Cats with Chronic Gingivostomatitis: A Randomized, Controlled and Blinded Study."

Principal Investigator(s): Boaz Arzi, Maria Soltero-Rivera; University of California-Davis School of Veterinary Medicine. \$27,392

This study is a continuation of previous research funded by EveryCat that developed a highly effective stem cell treatment for Stomatitis, a painful inflammation of the mouth in cats. By giving stem cells immediately after tooth extractions, it is expected to hasten the response to this treatment and improve their quality of life.

MT22-025: "Continuous rate infusion thrombolysis with tissue plasminogen activator, pentoxifylline and cyproheptadine in acute feline aortic thromboembolism – the ALPEXC trial."

Principal Investigator(s): Julien Guillaumin, Colorado State University. \$32,336

Blood clots sometimes occur in cats, especially those with heart disease, and are usually fatal. This study investigates a new protocol for continuous infusion of clot-busting drugs in children with blood clots to determine if it is effective in cats.

MT22-028: "Development of a new whole exome capture array for cat disease and cancer studies."

Principal Investigator(s): Leslie A. Lyons, PhD, University of Missouri. \$35,000

As genome sequencing (the identification of DNA gene sequences) has matured, new technologies have been developed to improve the accuracy and decrease the cost. This proposal takes it a step further by concentrating on the most important part of the genes, the exons, which code for proteins, and standardizing its use for the entire veterinary community.

MT22-033: "Re-evaluation of the current, and development of an updated, histopathologic set of criteria for the diagnosis and differentiation of gastrointestinal small-cell lymphoma from other forms of chronic enteropathies in cats."

Principal Investigator(s): Panagiotis G. Xenoulis, Jörg M. Steiner; Texas A&M AgriLife Research. \$34,856

Chronic intestinal diseases are common in cats and often caused by inflammation or cancer. But differentiating between the two is difficult, even with biopsies, and the treatments are very different. This study will develop a new method of analyzing intestinal biopsies to improve the accuracy of diagnosis and lead to more successful treatment.

2022-2023 CaP-K Grant Awards

Total Awarded \$259,925

CaP-K23-003: "Ammonia Excretion, A Novel Biomarker and Therapeutic Target for Feline CKD." Principal Investigator(s): Autumn N. Harris, University of Florida \$50,000

Chronic kidney disease (CKD) is commonly encountered in small animal practices and affects up to 31% of all cats. Management of CKD in cats has primarily focused on supportive therapy, with very few new treatments available that have improved outcomes. The primary purpose of this study is to determine if urinary ammonia excretion is associated with the development of metabolic acidosis or long-term clinical outcomes in cats with chronic kidney disease (CKD).

CaP-K22-002: "A longitudinal multi-matrix metabolomics approach for the identification of biomarkers of early feline renal disease." Principal Investigator(s): Sylvie Daminet, Department of Small Animals, Faculty of Veterinary Medicine, University of Ghent. \$41,601

Current tests for kidney disease in cats are typically diagnostic only after 70% of the kidney is damaged. This study uses metabolomics to identify and characterize small molecules in the blood and urine to design novel tests that diagnose kidney disease in earlier stages, before irreversible damage occurs.

CaP-K22-008: "Identification of urinary extracellular vesicles-derived microRNAs as sensitive and specific biomarkers for early-stage feline chronic kidney disease." Principal Investigator(s): Candice P. Chu, Lillian Aronson; University of Pennsylvania. \$23,000

In cats, elevations of current diagnostic tests occur only once severe kidney disease exists. In humans, alterations in the micro-RNA of kidney cells occur in patients with early renal disease. This study investigates and characterizes micro-RNA in cats with various stages of kidney disease to see if it can be used as an accurate diagnostic test for early kidney disease, before irreversible damage occurs.

CaP-K22-011: "Effect of caloric content on phosphorus balance and kidney function in healthy cats."

Principal Investigator(s): Carmen Pineda, Ignacio Lopez, University of Cordoba (Spain). \$44,099

The levels of phosphorus and calcium are closely related to the progression of kidney disease, where phosphorus increases as the disease progresses. This study investigates whether reduced caloric intake decreases phosphorus levels in cats.

CaP-K22-012: "Phosphoric acid implications to renal health and urine supersaturation for struvite and calcium oxalate in cats." Principal Investigator(s): Aulus Cavalieri Carciofi, Maria Eduarda Gonçalves Tozato. Universidade Estadual Paulista (UNESP)(São Paulo State University) \$49,000

Phosphorus metabolism is intimately related to the progression of kidney disease and the formation of kidney stones in cats, yet many cat foods contain a phosphoric acid additive to decrease the formation of kidney stones. This study investigates the effect of phosphoric acid on the occurrence of kidney disease and kidney stones in cats.

CaP-K22-013: "Screening for early feline chronic kidney disease: Unraveling the mystery of nonazotemic disease." Principal Investigator(s): Marleen Brans, DVM; Dominique Paepe, DVM, PhD, DECVIM; Emmelie Stock, DVM, PhD, DECVDI. Faculty of Veterinary Medicine, Ghent University. \$52,225

(CaP-K22-013 Continued) Cats develop kidney disease long before elevations in current diagnostic tests which indicate irreversible damage. This proposal uses a simplified "gold standard" test to characterize early kidney disease and update the international criteria. It also investigates two novel methods to identify cats with early kidney disease, before severe damage occurs.

Since 1968, EveryCat Health Foundation has awarded more than \$10 million in grants for groundbreaking research that benefits every cat, every day. From disease prevention and veterinary treatment to healthy home habits, we advance the science of better medicine for millions of cats.

Every cat. Every day. Everywhere.



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