

2020-2022 CaP-K Funded Grants – Total Funding \$393,543

CaP-K20-001: Investigating the genetic basis of total body phosphate overload in cats with mild azotemic chronic kidney disease.

Principal Investigators: Dr. Rebecca Geddes; Royal Veterinary College, London, United Kingdom. \$49,950

Many cats with chronic kidney disease develop high levels of phosphorus in their blood, leading to rapid decline and bone disorders. This study will perform whole genome sequencing to look for a genetic basis for this condition, leading to potential treatments and improved longevity.

CaP-K20-003: Impact of feline circadian rhythms on phosphorus and parathyroid hormone concentrations.

Principal Investigator: Andrea J. Fascetti, Professor, VMD, PhD, DACVN, DACVIM, University of California- Davis. \$34,563

Blood phosphorus levels are often measured in cats, especially those with kidney disease but, in humans, the level varies during the day (called the "circadian rhythm") affecting its interpretation. This study will measure the phosphorus level in normal cats throughout the day to determine if and how it changes, which will increase the accuracy of the interpretation of phosphorous levels and enable more accurate determination of abnormal results.

CaP-K21-004: The impact of synbiotics on the gastrointestinal microbiome and phosphate homeostasis in cats with chronic kidney disease.

Principal Investigators: Dr. Thurid Johnstone, Professor Caroline Mansfield, University of Melbourne. \$49,355

The intestinal tract of cats contains many different bacteria in a delicate balance, but cats with kidney disease have alterations in these bacteria ("dysbiosis") that may lead to worsening disease. This study compares the intestinal bacteria of normal cats to those with kidney disease to determine how it changes, leading to improved diagnostic tests and potential treatments with pre- and probiotics.

CaP-K21-005: Evaluation of untargeted urinary metabolomic profiling, microRNA (miRNA), and advanced glycation end products (AGEs) in cats with chronic kidney disease (CKD).

Principal Investigators: Joe Bartges, DVM, PhD, DACVIM, DACVN; Art Edison, MS, PhD; GRA. University of Georgia. \$49,750

Kidney disease is common in cats, but current tests can't diagnose it until the disease has progressed significantly. This study looks at different compounds in cat urine to determine if they can be used to diagnose kidney disease in earlier stages, improving the prognosis and longevity of these patients.

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.

\$41,601.00

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. \$23,000.00
In cats, elevations of current diagnostic tests occur only once severe kidney disease exists. In humans, alterations in the micro-RNA of kidney cells occurs 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). \$44,099.00
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) \$49,000.00

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. \$52,225.00

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.