



# THE WINN FELINE FOUNDATION

For the Health and Well-Being of All Cats

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## **2004 HEALTH STUDY GRANT AWARDS**

*Twelve studies funded for a total of \$138,949*

The Winn Feline Foundation was pleased to receive proposal from veterinary researchers around the world who were interested in improving feline health. Out of over 40 proposals, our team of outstanding veterinary consultants helped the Foundation selected the best twelve studies for funding. We look forward to seeing the results of these studies and being able to share them with both the veterinary community as well as breeders.

### **2004 ENDOWMENT STUDIES (Funded from investment income derived from our perpetual Endowment Fund)**

#### **A study on the basic function of the feline immune system**

*Establishment of a library of expressed genes in feline dendritic cells.* D. Bienzle, DVM, PhD, DACVP; University of Guelph, Canada; \$12,751

This study is an “investment” toward a molecular level of comprehension of the interaction between cats and viruses that infect them. Recently, “dendritic cells” (basic cell of the feline immune system) have been identified as the major orchestrator of immune responses. Dendritic cells are located throughout body surfaces, where they first detect invading microbes, and then activate the entire immune system. This proposal aims to discover many of the signals of the cat immune system by producing a library of genes expressed in dendritic cells. The genes of interest will then be printed on glass slides called microarray chips, which will be available to researchers for exact identification of the feline response to infection. Such chips will be a valuable tool for design of feline-specific drugs and treatments.

**RICKY FUND STUDIES (a fund for the study of hypertrophic cardiomyopathy in cats established by Steve Dale in memory of his cat, Ricky)**

**A search for a genetic cause for feline hypertrophic cardiomyopathy**

*Molecular evaluation of the feline myosin binding protein C gene in Maine Coon cats with familiar hypertrophic cardiomyopathy.* Kathryn M. Meurs, DVM, PhD and Mark D. Kittleson, DVM, PhD; Ohio State University (Meurs) and University of California (Kittleson); \$15,000

(This study was also partially funded by stipulated donations)

Feline hypertrophic cardiomyopathy (HCM) is the most common cause of heart disease in the adult cat. Affected cats are at risk of sudden death, the development of heart failure, or a blood clot that may paralyze the hind legs. In humans, the disease is most commonly an inherited defect associated with a mutation in one of several important cardiac genes. Previous studies by these researchers, funded in part by the Winn Feline Foundation, have demonstrated that HCM in cats is inherited in a manner similar to the disease in humans. Evaluation of the common genes that cause HCM in humans has allowed these researchers to rule out several important genes in the cat. Recently, they determined that an important cardiac protein, myosin binding protein C, was significantly reduced in HCM-affected cats. This study will show whether a mutation in the gene for this protein is associated with the development of inherited HCM in a colony of Maine Coon cats.

**BREED-FUNDED STUDIES: (This study was partially funded by the efforts of the Siamese Breed Council and many other interested breeders.)**

**A new drug for treatment of feline mammary tumors**

*EGFR and HER2/neu expression in feline mammary gland adenocarcinoma and the effects of a novel EGFR inhibitor (Iressa<sup>®</sup>) on proliferation and apoptosis in vitro.*

Sarah C. Charney, DVM, DACVIM; Anne Barger, DVM, DACVP; Timothy Fan, DVM, DACVIM; L-P de Lorimier, DVM; University of Illinois; \$10,800

Mammary gland tumors are a common tumor in the cat and most are highly aggressive tumors that will spread throughout the body. Treatment to date has included surgery with or without chemotherapy and/or radiation. However, these treatments have had disappointing results. A new drug, gefitinib (Iressa<sup>®</sup>), has been efficacious in human breast cancer clinical trials. Significantly fewer side effects occur with this drug than with chemotherapy or radiation therapy. Gefitinib may prove to be a readily available and effective treatment for feline mammary gland adenocarcinoma. In this study, researchers hope to show that gefitinib will be an effective treatment for breast cancer in the cat.

## NEW STUDIES

### **Treatment of feline sarcomas with gene therapy**

*Treatment of feline soft-tissue sarcomas using heat-inducible interleukin-12 gene therapy.* Susan M. LaRue, DVM, MS, PhD; Farzan Siddiqui; Colorado State University; \$14,904

Immunotherapy uses the body's immune system, either directly or indirectly, to fight cancer. It has the potential ability to act on the primary tumor as well as metastasis. Interleukin 12 (IL 12) is a protein that belongs to the family of substances known as cytokines. Various studies have shown that IL 12 is effective in the treatment of some tumors. These investigators will develop a novel system to deliver gene therapy directly to the site of the tumor.

### **Complementary therapy for treatment of liver disease in the cat**

*Silybin, an antioxidant treatment for liver disease in cats.* David C. Twedt, DVM, DACVIM; Craig Webb, PhD, DVM, DACVIM and Mark Papich, BS, DVM, MS, DACVCP; Colorado State University; \$14,660

Alternative or complementary therapies are gaining interest today. In humans and animals, an herbal product frequently prescribed for treatment of liver disease is milk thistle. The principal extract of this herbal product is silybin. Recent studies have shown promising effects of this compound in the treatment of human liver disease. The mechanism of silybin's action is thought to be as an antioxidant, yet there is no scientific information determining a correct dose or efficacy of silybin in the treatment of feline liver disease. The only information regarding milk thistle therapy in cats is anecdotal. The purpose of this study is to determine an appropriate dose of silybin for cats and to determine the antioxidant effects of silybin in the blood of cats having liver disease.

### **An investigation into the immune response to feline coronavirus infection**

*Post-transcriptional changes of alpha-1-acid glycoprotein during feline coronavirus infections.* Saverio Paltrinieri, DVM, PhD, DECVCP; Fabrizio Ceciliani, DVM, PhD; Alessia Giordano, DVM and Vanessa Pocacqua; University of Milan, Italy; \$14,489 (This study was partially funded by stipulated donations and it is the first Winn-funded study from Italy.)

Feline coronavirus (FCoV) infections are common in cats. Infected cats may shed different levels of coronavirus in multicat environments, but the immune mechanisms responsible for this apparent difference are not known. In the same way, the manifestations of feline infectious peritonitis (FIP) are variable, and although a genetic predisposition has been demonstrated, little information about the role of the immune system is available. Alpha<sub>1</sub>-acid glycoprotein (AGP) is an acute-phase protein involved in the immune response that has a different behavior in cats with FIP compared to FCoV-infected non-symptomatic cats. In this project the researchers will investigate the relationship between the FCoV-shedding characteristics or the clinical appearance of FIP on one hand, and the presence of different forms of AGP on the other.

### **New methods for control of pain in cats**

*Use of intravenous lidocaine for analgesia in cats.* Jan E. Ilkiw, BVSc, PhD; Sheila A. Robertson, BVMS, PhD, DACVA and Bruno Pypendop, DrMedVet, DrVetSci, DACVA; University of California (Ilkiw, Pypendop) and University of Florida (Robertson); \$7420

Treating pain is arguably the most important role of the veterinarian. This can be difficult in cats due to their limited tolerance for the most commonly used pain medications. Lidocaine is a local anesthetic commonly used to treat pain in many species, including cats. When given intravenously, lidocaine can alleviate pain from different causes. However, no data on the use of intravenous lidocaine for treatment of pain in cats is available. These researchers will investigate the safety and efficacy of lidocaine in different doses.

*Effects of buccal buprenorphine administration on stress hyperglycemia in healthy client-owned cats.* Patty Lathan, BA, VMD; P.K. Hendrix, DVM, PhD, DACVA; Andrew Mackin, BSc, BVMS, MVS, DVSc, DACVIM and Carolyn Boyle, PhD; Mississippi State University; \$1,195.17

Increased blood glucose (hyperglycemia) concentrations caused by stress are common in cats. Stress hyperglycemia can complicate the monitoring of diabetic cats. Since insulin doses are sometimes adjusted based on blood glucose levels taken over a period of time (a *glucose curve*), an increase in blood glucose caused by stress can make it very difficult to interpret the true effectiveness of insulin. Buprenorphine is a morphine-like medication that helps make cats easier to handle and that can be administered by owners at home. The purpose of our study is to determine whether the home administration of buprenorphine will decrease stress hyperglycemia in cats.

### **Early detection of feline gastrointestinal lymphoma**

*Early detection of feline gastrointestinal lymphoma: molecular and immunological distinction from inflammatory bowel disease.* R.E. Goldstein, BSc, DVM; Kenneth Simpson, BVM&S, MRCVS, PhD and Sean McDonough, BS, DVM, PhD; Cornell University; \$14,980

Gastrointestinal (GI) lymphoma is the most common type of feline GI cancer, typically affecting middle-aged to older cats. Clinical signs commonly include severe weight loss with or without anorexia, vomiting, or diarrhea. Earlier diagnosis and treatment hold the promise of greater survival times. However, current diagnostic techniques based on microscopic assessment of GI biopsies make it difficult in some cases to distinguish inflammatory bowel disease (IBD - a non-cancerous inflammatory invasion of immune cells into the intestinal wall of cats) from lymphoma. The objective of this study is to define the inflammatory and immune responses of the gastrointestinal tracts of cats with GI lymphoma.

### **Development of genetic tests for certain cat traits**

*Genetic mapping of phenotypic traits in the domestic cat.* Leslie A. Lyons, PhD; University of California; \$15,000

Domestic cats throughout the world have at least twenty-three well-known single-gene traits. These traits affect coat color, color distribution, the marking patterns on the coat, ear conformation, tail conformation, and fur type, including length. In combination with various body types, these genes are responsible for the distinguishing characteristics of the over three dozen cat breeds recognized in the United States alone. In order for cat breeders to determine the recessive traits carried by a given cat, time-consuming and expensive test breeding is necessary. The identification of genetic markers for some of these traits will allow cat breeders to determine carrier status with a blood test. Knowing a cat's carrier status would reduce the need for test matings. These traits can also be used in forensic and other biological applications.

### **Investigation of the different strains of *Cytauxzoon felis***

*Comparison of the rDNA ITS-1 and ITS-2 regions of different isolates of C. felis with varying pathogenicity.* Theresa E. Rizzi, DVM; Mason Reichard, PhD; James H. Meinkoth, DVM, PhD, DACVP and A. Alan Kocan, MSPH, PhD; Oklahoma State University; \$2,750

*Cytauxzoon felis* is a protozoal disease affecting domestic cats primarily seen in the south-central United States. The disease is tick-transmitted and, until recently, reported to be nearly 100% fatal. Once a tick has given the disease to a cat, there is rapid progression and death occurs within a week, with or without treatment. Recently, cases of domestic cats in a certain geographic location in western Arkansas and eastern Oklahoma have survived the disease and appear to have developed immunity. It is thought these cats are infected with a less aggressive strain of *Cytauxzoon felis*. Currently, there is no way to differentiate the different strains of the organism, and these researchers will develop a test.

### **A genetic test for an important inherited disease**

*Development of a genetic test for polycystic kidney disease in cats.* Leslie A. Lyons, PhD; University of California; \$15,000

Polycystic kidney disease is a relatively common inherited disease in some pedigreed breeds. Signs of this disease are not often seen until later in life. In many breeding programs, affected or carrier cats are used for breeding before clinical signs have appeared. Ultrasound screening is currently available to screen breeding cats, but there is a need for a highly reliable and cost-effective test. Finding the genetic mutation that causes PKD will allow DNA testing to identify cats carrying the gene before they are used in a breeding program. Through the examination of DNA samples already collected by the researcher, a mutation that is highly likely to be responsible for feline PKD has been identified. This phase of the research was partially funded by the Winn Feline Foundation. Work must now be carried out to confirm the responsible mutation and develop a simple genetic test for PKD.

**For more information, contact:**

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