For Immediate Release

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2011 FELINE HEALTH GRANT AWARDS
8 projects funded for a total of $140,324

The Winn Feline Foundation receives proposals from veterinary researchers around the world who are interested in improving feline health. Out of 42 proposals for 2011, our team of expert veterinary consultants helped the Foundation select 8 projects for funding for a total of $140,324. The Winn Foundation looks forward to seeing the results of these projects and to sharing them with the veterinary community as well as with cat owners and pedigreed cat breeders.

If you would like to help one of these projects, Winn is seeking donations of $250 and up to sponsor specific projects. Sponsors will receive progress reports as they are received by Winn and copies of any publications that result and are provided by the researcher. A listing of the projects available for sponsorship appears at the end of the descriptions. Donations can be made on line at www.winnfelinehealth.org

A Reproducible Protocol to Isolate a Characterized Population of Adult Feline Progenitor Cells $9,995
James R. Wignall BSc BVetMed (hons) MRCVS; Mandi J. Lopez DVM MS PhD; Louisiana State University School of Veterinary Medicine

A number of problems that affect cats are caused by tissue damage or loss from illness, injury, or aging. Adult stem cells maintain and heal tissues throughout an animal’s life and multi-potent stromal cells (ASCs) derived from fat have been found in fat tissue of many species. The cells can form different tissues like fat, bone, and cartilage, and cells from one animal can be used in another. Fat tissue is easily obtained during routine castration of male cats, so additional surgeries to get the tissue are not necessary. To date, cat ASCs are largely unexplored and an optimized and repeatable isolation technique is needed to provide cells for potential treatments. The best method to isolate feline ASCs and the potential for cell banking for treatment of ill and injured patients will be determined in this study. The results will significantly advance adult stromal cell applications to treat feline companions.

Evolution of Feline Infectious Peritonitis Virus Within FIP Cats and Tissue-specific Adaptation of the Virus to Activating Proteases $23,986
Gary R. Whittaker, Professor, Cornell University

Feline infectious peritonitis (FIP) is a deadly disease of cats, caused by a viral infection. The virus normally resides in the gut of the cat, but can mutate, infect the immune system of certain cats, and then spread to other tissues (e.g., liver, brain). Based on an analysis of the genome sequence of viruses that infect different tissues, researchers propose that key changes in the surface protein of the virus adapt it to the different tissues. The researchers propose to perform laboratory-based experiments on post-mortem samples to define the sequences of the different viruses in the different tissues. The work will characterize the changes that occur in the virus surface protein, allowing a more detailed understanding of this devastating disease for which there remains no effective treatment.

A Cohort-controlled Study of Diarrheagenic E. coli, Concurrent Enteric Infection, and Failure of Passive Transfer as Contributing Risks for Mortality in Kittens $23,600
Jody L. Gookin, DVM, Ph.D., DACVIM; Maria Correa, DVM, Ph.D.; Jim Guy, DVM, Ph.D., & James Flowers, Ph.D., North Carolina State University; Chobi DebRoy, Ph.D., The Pennsylvania State University.

It is estimated that a staggering 180 million kittens are born each year to the owned and feral cat population of the United States. Approximately 15% of these kittens will die or be euthanized because of illness before 8 weeks of age. Many of these kittens have diarrhea at the time of death that is suspected to be caused by infection, but studies to prove this are lacking. Possibly, many of
these kittens lack the immunity that comes from mother’s milk, predisposing them to infectious disease. It was recently discovered that a significant number of kittens that die while in foster care have E. coli bacteria adhering to the lining of the intestine. These E. coli were not found in surviving kittens. The purpose of this study is to determine what kinds of E. coli are infecting these kittens. Researchers will examine the role of concurrent GI infection and failure of maternal immunity as likely contributing causes of mortality. It is believed that these conditions can be diagnosed and treated. The study will use post-mortem samples from foster-age kittens that died or were euthanized at the SPCA because of severe illness (50) and from a group of “healthy” kittens euthanized by Animal Control because of overpopulation (50). The multidisciplinary research team will use an intensive diagnostic testing strategy to determine the effect of specific E. coli pathotypes, concurrent GI infectious agents, and inadequate maternal immunity on mortality in the foster kitten population.


Diarrhea is frequently a primary or contributing cause of death of foster-age kittens. Among the causes of diarrhea, bacterial culprits are perhaps the most problematic to identify. Enterococcus species are generally considered to be normal inhabitants of the intestine, but include members that are significant pathogens such as E. faecium and E. faecalis. Pathogenic enterococci are generally capable of forming extensive colonies called biofilm that adhere to host tissue and are very difficult to eradicate. In studies funded by the Winn Feline Foundation, the researchers discovered that a common enterococcus of the feline intestine called E. hirae can form an incredible biofilm along the lining of the intestine, and those kittens with this biofilm have a survival advantage. Conversely, kittens with E. faecium or E. faecalis were more likely to have died or been euthanized. They also discovered that a significant number of kittens had died with an E. coli rather than E. hirae biofilm lining the intestine. These observations led to the hypothesis that E. hirae is a natural probiotic of the kitten intestine, and that it is able to form a biofilm that can protect against a significant cause of kitten death - attaching and effacing E. coli infection. Also, researchers believe that E. faecium and E. faecalis are poorly able to out-compete E. coli and may be directly injurious. Researchers will examine these mechanisms in laboratories using 476 feline Enterococcus spp. isolates obtained from the prior study. Findings may have an enormous impact on selection of probiotics that directly promote the survival of kittens.

Immunohistochemical Staining of VEGFR, PDGFR, and cKit In Feline Oral Squamous Cell Carcinoma $9,097  Evan Sones, DVM, Medical Oncology Resident. Annette N. Smith, DVM, MS, DACVIM, Stephanie Schleis, DVM, DACVIM (Oncology), Calvin Johnson, DVM, PhD, DACVP, Auburn University.

Oral cancer accounts for 10% of all cancers in the cat, with oral squamous cell carcinoma (OSCC) accounting for about 60% of cases. This disease causes life-limiting clinical signs including excessive salivation, appetite loss, loose teeth, difficulty eating, and weight loss. OSCC is a devastating disease to encounter for the feline patient and owner. Further, it is a frustrating disease for the clinician, since this cancer responds poorly to therapy and no major advancements have been made in treatment despite continued research. Receptor tyrosine kinases (RTK’s) are a class of receptors on the surface of cells that, when activated, control a variety of normal cell functions and are involved in the development of many tumor types. Staining of cells can be performed to determine if these receptors are present at normal levels. Researchers will perform staining of fifteen previously taken feline OSSC biopsy samples to determine the level of these receptors in the cells. Tyrosine kinase inhibitors are a class of drugs new to veterinary medicine. If these receptors are over-expressed in feline OSSC samples, it may be possible to use this new class of drugs for treatment of this disease.

Cetuximab Targeting of Epidermal Growth Factor Receptor in Feline Oral Squamous Cell Carcinoma $15,000  Stuart C. Helfand, DVM, Professor, Krystal Claybrook, DVM, Oregon State University.

Growth of cancer cells is influenced by factors the cells encounter in the local environment in which they live. They require input from without to stimulate internal development and growth, much the way plants may be stimulated to grow when provided with nutrients in the soil in which they are planted. Squamous cell carcinoma (SCC) is a common and deadly oral cancer in the cat for which there are no truly effective therapies. This study is intended to determine the feasibility of depriving feline SCC cells from external stimulation as a strategy to arrest cell growth and contain the tumor. The researchers plan to investigate the potential to use a commercially available protein that attaches to specific entry points on the surface of SCC cells, blocking substances in the tumor “soil” that trigger growth from gaining access to these docking sites. Results from the laboratory-based studies in this project will form the basis for advancing this novel treatment concept into the clinical setting as a new and hopefully improved therapy for cats with devastating oral SCC.

Establishment and Validation of a Feline Immunodeficiency Virus Vector for the in vitro Production of Feline Erythropoietin $11,760  Brian Murphy, DVM, PhD, DACVP, Natalia Vapniarsky, DVM, University of California, Davis.
Chronic kidney disease is a common problem in aging cats. The cat’s diseased kidneys often do not produce enough erythropoietin hormone leading to a deficiency of red blood cells (anemia). Anemia contributes significantly to the morbidity of the cats with chronic renal failure. A therapeutic solution available to overcome this problem is the administration of commercially available human erythropoietin to cats with chronic renal disease. Generally, this treatment is effective for a limited period of time, but eventually fails as a result of an immunologic reaction against the administered human erythropoietin. The researchers propose a gene therapy system that will shuttle the natural feline erythropoietin gene into cat cells. Ideally, treated cells will express natural feline erythropoietin. This study describes an in vitro proof of concept pilot project for a subsequent in vivo gene therapy trial involving anemic cats with renal failure. Results from this study could contribute significantly to the overall health and well-being of cats with chronic anemia associated with renal disease.

DNA Array Analyses for Cat Diseases  $25,000  Leslie A. Lyons, PhD, University of California, Davis.

Feline researchers have been anxiously awaiting the developing genomic resources for the cat. The National Institutes of Health sponsored the primary resource, a better genome sequence for the cat, which was performed by Washington University at St. Louis. The variety of cats used in the sequencing project allowed the detection of the normal DNA variations of the domestic cat. The most common variants are known as SNPs (single nucleotide polymorphisms). An important by-product of the DNA sequencing effort is the identification of this normal genetic variation. A resource called a DNA array or DNA chip can then be produced that contains assays for the highly polymorphic and evenly dispersed SNPs. Thus, these arrays can assess the entire genome of the cat in one experiment, which is known as a genome-wide association study (GWAS). Because the SNPs are at such a high density, the cats used for a GWAS can be from a population, not direct relatives. To date, genetic studies have required large extended families. Now, cases (cats with the trait) and controls (cats without the trait) from the families and the population can be examined with the arrays. In addition, there is less concern for the mode of inheritance of the trait; GWAS can be performed with dominant, recessive, X-linked, and even traits that may have complex inheritance but a high heritability or relative risk in a population. Fewer cases are required for a recessive trait, more for a dominant trait, and more for relative risk studies – the more cases, the lower the relative risk. The Lyons laboratory has long been in preparation for the coming DNA arrays. This study supports a researcher to analyze the DNA array data. Previously and currently supported Winn projects will be prioritized, including Burmese craniofacial defect, Persian and Bengal PRA, and dominant traits, such as dominant white and ear fold.

Projects Seeking Sponsors ($250 minimum donation) include:

**FIP/ Feline Infectious Peritonitis:** Evolution of feline infectious peritonitis virus within FIP cats & tissue-specific adaptation of the virus to activating proteases

**Kitten Diarrhea:** Intestinal Biofilm formation by enterococci in Kittens -- Determining the identity & virulence determinants of those associated with life and death

**Oral Cancer:** Cetuximab Targeting of Epidermal Growth Factor Receptor in Feline Oral Squamous Cell Carcinoma

**Feline Genes and Diseases:** DNA Array Analyses for Cat Diseases

Sponsorships available on our website: [www.winnfelinehealth.org](http://www.winnfelinehealth.org) or by mailing your donation to Winn Feline Foundation, 390 Amwell Rd, Suite 402, Hillsborough, NJ 08844

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