Scientific discoveries are continuous, and Morris Animal Foundation’s quest for better veterinary medicine never ends. Whether the goal is understanding the role of genetic mutations or unmasking the mysteries of a new virus, veterinary advances transpire one step at a time. Every study leads us one step closer to new treatments, better preventions and, ultimately, hope for a brighter world for animals.

But we need your help

We can’t fulfill our mission without the support of committed partners. You can make animals’ lives better by sponsoring research through Morris Animal Foundation.
Advances that make a global impact

Morris Animal Foundation is the global leader in supporting scientific research that advances veterinary medicine. Since our founding, we’ve invested more than $70 million in 2,000-plus studies that have improved the health and quality of life for dogs, cats, horses and wildlife in more than 100 countries on all seven continents.

These studies have led to better preventions, diagnostic tools, treatment protocols and even cures for what ails the world’s animals. Some of these breakthroughs have become industry gold standards that are now used in every veterinary practice in the country.

Investing in a brighter world

Morris Animal Foundation’s ongoing investment in veterinary science has led to
• The first vaccines for deadly illnesses, including canine parvovirus, feline leukemia and equine valley fever
• Cancer breakthroughs, including better diagnostic tests and more effective chemotherapy for dogs and cats
• Knowledge that helps veterinarians manage feline diabetes and canine kidney disease through diet
• Genetic tools that help prevent and manage equine diseases, such as tying-up and lavender foal syndrome
• Establishment of the Mountain Gorilla Veterinary Project, a model conservation program for providing care and treatment to an endangered species in its natural habitat
• Improved assisted reproduction protocols, better nutrition and disease management for a multitude of endangered animals, including cheetahs, frogs, pandas, elephants and sea otters

By investing in top-notch science, Morris Animal Foundation has a worldwide impact on animal health. Our ongoing quest for new discoveries and knowledge makes a true difference in the lives of animals—today and tomorrow.

Good science at heart
Morris Animal Foundation invests in science because it empowers researchers to advance animal health on a global scale. Receiving a Foundation grant is a highly competitive process. To receive our support, a study must
• Involve clear, achievable objectives; an innovative approach; and, preferably, a training component
• Address a disease or issue that has a great need for research and affects a large number of animals
• Be designed to make a significant impact on its identified field
• Adhere to our health policy for animals used in research
Curing animal diseases and improving quality of life for animals are long-term goals that require significant investment in veterinary research. Morris Animal Foundation needs the help of partners who believe that investing in Morris Animal Foundation is the best way to invest in the future of animal health.

Sponsorship gives you the opportunity to help address a specific disease or health issue, support a specific institution or support research that helps a favorite species.

Why should you sponsor a study through Morris Animal Foundation?

When you sponsor a study through Morris Animal Foundation, you support scientific research that will advance veterinary medicine on a global scale.
- Your commitment will help companion animals and wildlife worldwide.
- You can support research that will address a specific species or disease.
- You publicly reinforce your personal or your organization’s values.
- Your investment will be wisely spent, as our Charity Navigator status attests.

What you get in return

Study sponsors make Morris Animal Foundation’s work possible. By becoming a study sponsor at $3,000 or more, you ensure that the Foundation is able to fund future scientific advancements for cats, dogs, horses and wildlife. As a sponsor, you will receive
- Progress updates throughout the length of the study
- Final reports
- A thank you letter from the lead researcher
- Recognition on the Morris Animal Foundation website and in printed publications that discuss your study

Join us in changing the course of veterinary medicine and making the world a brighter place for animals.

Three steps to better animal health

1. Select the study you wish to sponsor.
2. Contact a member of the development team at sponsorship@MorrisAnimalFoundation.org or 800.243.2345 to discuss study availability.
3. Make a generous gift of $3,000 or more per study, or fully sponsor a study.
Veterinary advances for cats

Since 1950, Morris Animal Foundation has been caring for cats, investing in more than 300 feline health studies for a total exceeding $9.5 million. Here are some of the significant health advances that have occurred for cats because of our funding.

**Dietary management of diabetes:** Researchers determined that a high-protein diet could help cats with diabetes lose weight and may eliminate the need for insulin. Veterinarians now incorporate this information into treatment plans for cats with diabetes.

**Improved management of respiratory illnesses in shelters:** Multiple studies led to the development of a new type of cage as well as cleaning and management recommendations for shelter personnel. These studies are changing the way cats are housed in shelters and reducing the spread of upper respiratory illness, a top reason for euthanasia in shelters.

**Tool for studying genetic diseases:** The Foundation supported the development of a genetic tool that scientists around the world can now use to discover genetic mutations and predispositions to feline diseases.

**First vaccine for feline leukemia:** Studies helped lead to the first vaccine for feline leukemia, which has saved the lives of thousands of cats.

**Tools to diagnose and treat cancer:** Researchers developed tools to better diagnose and treat cats with inflammatory bowel disease and gastrointestinal cancer. Scientists also improved a technique to distinguish between injection-site sarcomas and other forms of cancer, thus helping veterinarians choose the proper treatment.

*Morris Animal Foundation has pledged $1 million for feline health studies this year alone. Your sponsorship gift of $3,000 or more is critical to ensuring that we can fund future studies.*
Bone/Musculoskeletal
Managing Chronic Pain in Cats with Osteoarthritis
Dr. Mary Klinck, University of Montreal, Canada, Fellowship, D10FE-901

Total Study Cost: $176,000

Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. This study validates pain scales that will be used to identify and quantify osteoarthritis-related pain in cats.

Comparing Cat Breeds to Identify Genetic Reasons for Bone Disease
Dr. Bianca Haase, University of Sydney, Australia, D12FE-021

Total Study Cost: $52,628

Scottish Fold and American Curl cat breeds are easily identified by their unusual ears, an inherited trait that appears to be linked to bone malformations and arthritis in Scottish Folds but not in American Curls. This study identifies the genes and chromosomal regions responsible for the folded-ear trait and may provide insight into cartilage physiology and the broader problem of osteoarthritis in cats.

Cancer
Evaluating a New Therapy for Feline Oral Cancer
Dr. Elizabeth A. McNiel, Tufts University, D10FE-021

Total Study Cost: $128,153

Feline oral squamous cell carcinoma is a common cancer affecting older cats. Prognosis is poor, even with aggressive treatment involving surgery, radiation therapy and chemotherapy. This study evaluates the effectiveness of a synthetic protein that targets the tumor’s blood supply to reduce or stop tumor growth.

Understanding the Genetic Role MicroRNAs Play in Cancer
Dr. Thomas J. Rosol, The Ohio State University, D12FE-015

Total Study Cost: $148,974

Understanding the genetic basis of cancer is crucial for improving diagnosis, treatment and prevention. MicroRNAs are small non–protein-coding molecules that have been shown to be involved in the initiation and progression of cancer in humans. This study examines microRNAs as potential therapeutic targets or prognostic markers in feline cancers.
Studying Ways to Suppress Oral Cancer in Cats

Dr. Beth S. Lee, The Ohio State University, D13FE-004

Total Study Cost: $116,143

Oral squamous cell carcinoma, the most common oral cancer in cats, carries a poor prognosis because it aggressively destroys the jaw bone. Researchers will determine whether suppressing a tumor-produced molecule will limit the breakdown of bone tissue. If this treatment is successful, suppressing this molecule could help prevent bone loss and improve the prognosis.

Identifying Lymphoma Subtypes for Better Treatment

Dr. Rachael Thomas, North Carolina State University, D13FE-008

Total Study Cost: $85,659

The prognosis for cats with gastrointestinal (GI) lymphoma, which is among the most common cancers of cats, varies widely depending on the cancer subtype. This study identifies chromosomal abnormalities in feline GI lymphomas to help classify this cancer into subtypes for more effective treatment. It also investigates the relationship between feline GI lymphoma and inflammatory bowel disease.

Evaluating Genetic Suppression of Oral Cancer Cells

Dr. Donald Andrew Yool, University of Edinburgh, Scotland, D13FE-007

Total Study Cost: $192,253

Feline oral squamous cell carcinoma is a common cancer that responds poorly to treatment. A key mechanism in cats contributes to the invasive and malignant nature of this disease. This study identifies the gene that controls this mechanism and evaluates whether suppressing the gene in cancer cells could help treat the disease in cats.

“Your generosity has provided the resources to generate both new knowledge and new expertise, which will benefit cat health and welfare for decades to come.”

— C. A. Tony Buffington, DVM, PhD, DACVN
The Ohio State University
Genetics

Improving the Feline Genome Assembly

Dr. William J. Murphy, Texas A&M University, D12FE-019

Total Study Cost: $177,508

Domestic cat genome maps and sequencing resources have helped scientists identify more than a dozen genes that influence feline diseases. Studies using these tools have led to genetic tests; however, a more comprehensive map is needed for better diagnosis of genetic diseases in cats. This study improves the quality of the cat genome map and sequencing resources.

Identifying Genetic Differences Between Scottish Wildcats and Hybrids

Dr. Paul O’Donoghue, University of Chester, United Kingdom, D12FE-564

The Scottish wildcat is classified as vulnerable and is Britain’s most endangered mammal. Fewer than 400 pure wildcats remain in the United Kingdom. Researchers are developing a diagnostic genetic tool to accurately identify pure wildcats from hybrids to promote conservation efforts.

Heart/Cardiovascular

Evaluating a Drug to Prevent Fatal Blood Clots

Dr. Gregg Rapoport, University of Georgia, First Award, D13FE-304

Total Study Cost: $41,020

Cats with heart disease often die of blood clots. This study evaluates a new orally administered anticlotting drug, rivaroxaban, which has shown promise in treating people with heart disease. Identification of a drug that could effectively and safely prevent blood clots in cats would significantly improve outcomes for cats with heart disease.
Analyzing the Genetics of *Mycoplasma haemofelis*

Dr. Joanne B. Messick, Purdue University, D10FE-004

**Total Study Cost: $176,075**

About 25 percent of all cats that are anemic or acutely ill are also infected with *Mycoplasma haemofelis*, a parasitic bacterium. This study analyzes the genetics of *M. haemofelis* to help identify new diagnostic targets and treatments to limit or prevent *M. haemofelis* infection in cats.

Identifying Molecular Markers of Virulent Feline Calicivirus Infection

Dr. John S. Parker, Cornell University, D12FE-002

**Total Study Cost: $253,685**

Feline calicivirus (FCV) commonly causes upper respiratory symptoms, pneumonia and mouth sores. This study examines the molecular biology of FCV strains to determine which result in severe disease and which cause only mild symptoms. The information from this study could help identify virulent strains early so cats can be treated quickly.

Establishing Continuous Cultures of a Tick-Transmitted Parasite

Dr. Patricia J. Holman, Texas A&M University, D12FE-017

**Total Study Cost: $95,754**

*Cytauxzoon felis* is a tick-transmitted parasite that causes rapid and frequently fatal disease in domestic cats. This study determines the optimal conditions needed to establish laboratory cultures of *C. felis* blood-stage parasites. Having these continuous cultures available would help researchers conduct more studies on *C. felis* and find ways to prevent and cure this disease.

Understanding Genetic Variations Predisposing Cats to FIP

Dr. Gary R. Whittaker, Cornell University, D10FE-511

**Total Study Cost: $129,328**

This study is evaluating the genetic factors predisposing cats to feline infectious peritonitis (FIP), a fatal disease in cats. The ultimate outcome of this study will be to develop a diagnostic tool for preventing FIP outbreaks in shelter cats.
Immunology/Infectious Disease

Identifying Genes to Create a Vaccine Against a Deadly Feline Parasite

Dr. Adam J. Birkenheuer, North Carolina State University, D12FE-026

**Total Study Cost: $148,303**

Cytaxozoonosis is a life-threatening disease of domestic cats that is similar to malaria in humans. Without treatment, 97 percent of cats with cytauxzoonosis die, and even with treatment, mortality rates approach 40 percent. Using the recently deciphered *Cytaxozoon felis* genome sequence, researchers will identify and prioritize which genes are the best vaccine candidates for this disease.

Developing Tests for Viruses that Cause Stomach Distress in Cats

Dr. James F. X. Wellehan, University of Florida, D13FE-009

**Total Study Cost: $118,800**

Astroviruses are suspected to cause sickness in cats, especially young cats in shelters. This study looks for novel astroviruses in cats in order to identify associations between blood concentrations of the viruses and clinical signs, such as diarrhea, and to develop more rapid and inexpensive testing for these viruses. These tools will help veterinarians better diagnose and manage astrovirus infections in cats.

Evaluating a New Technique for Detecting Disease Pathogens in Cats

Dr. Sue VandeWoude, Zoological Society of Cincinnati, Pilot Study, D13FE-803

**Total Study Cost: $11,880**

This study evaluates a new technology to identify and characterize feline viral pathogens. The researchers will design short pieces of DNA that can help them search for feline pathogens that are difficult to link to disease using conventional technologies. This new technique has the potential to improve discovery, detection, treatment and prevention of pathogens that cause disease in cats.

Assessing Ways to Prevent Viral Transmission to Kittens

Dr. Colleen A. Lambo, Zoological Society of Cincinnati, Pilot Study, D13FE-803

**Total Study Cost: $11,868**

Feline infectious peritonitis, a fatal disease of cats, is caused by a mutant form of a common cat virus, feline enteric coronavirus (FECV). This study assesses the viral presence and measures antibody levels of FECV in female cats and their newborn kittens. Results may lead to modification of current methods for early weaning and isolation of kittens to prevent viral transmission from their mothers.
Metabolic

Managing Insulin Resistance and Hepatic Lipidosis in Cats

Dr. Melissa Clark, University of Illinois, Fellowship, D09FE-906

Total Study Cost: $176,000

Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. This fellow is testing a new class of antidiabetic drugs to determine their ability to treat cats with insulin resistance and hepatic lipidosis, a common feline liver disease.

Evaluating the Use of Stem Cells to Control Kidney Disease

Dr. Steven W. Dow, Colorado State University, D12FE-025

Total Study Cost: $108,518

Chronic kidney disease (CKD) is a common cause of illness and death in cats, yet most commonly used diagnostic tests cannot reliably detect the disease until the advanced stages. This study evaluates the effectiveness of stem-cell therapy in treating cats with CKD and its ability to reverse or stabilize kidney function.

“Thank you for your support of the Morris Animal Foundation. In this study, we saved multiple shelter cats that would have been euthanized for severe upper respiratory tract disease while showing that both topical feline herpesvirus/feline calicivirus vaccine...could be effective treatments.”

— Michael R. Lappin, DVM, PhD, DACVIM
Colorado State University
Determining the Effectiveness of Stem Cell Therapy in Cats
Dr. Maciej Parys, Michigan State University, Fellowship Training, D13FE-405

Total Study Cost: $108,920

Mesenchymal stem cells (MSCs) show promise for treating a variety of chronic inflammatory diseases in cats. This study identifies the in vitro and in vivo effects of feline MSC treatment on the immune system and evaluates the safety and effectiveness of its use in cats with idiopathic cystitis or inflammation of the bladder.

Evaluating a Novel Treatment for Feline Diabetes
Dr. Craig B. Webb, Colorado State University, D13FE-003

Total Study Cost: $32,326

Diabetes is a common disease in cats that is thought to involve significant amounts of oxidative stress, which may also be linked to many other diseases. Cats are not well equipped to handle oxidative stress, and therefore, antioxidant supplementation may help them (and their owners) deal with diabetes. This clinical trial evaluates how a nutraceutical antioxidant affects clinical signs and biochemical abnormalities in cats with diabetes.

Analyzing Gene Therapy for Treating Anemia
Dr. Brian G. Murphy, University of California–Davis, First Award, D13FE-302

Total Study Cost: $118,800

Kidney failure is a common problem in aging cats, and chronic anemia is often a secondary result. Current state-of-the art treatments for kidney failure–associated anemia are inadequate. This study assesses the safety and efficacy of a novel gene therapy system aimed at resolving anemia and improving other associated symptoms in cats.

Metabolic
Since 1950, Morris Animal Foundation has been caring for dogs, investing in more than 800 canine health studies for a total of $30 million. Here are some of the significant health advances that have occurred for dogs because of our funding.

**Improved cancer treatments and diagnostics:** Nearly 200 canine cancer studies have led to more effective treatments for multiple cancers, an early diagnostic test for lymphoma and the identification of genetic causes for cancer.

**Genetic tests to identify blindness genes:** Scientists identified the genes that are predictive of a group of blinding diseases and developed breed-specific DNA tests to identify genetic carriers. These tests are now helping to prevent blindness in more than 47 breeds.

**First parvovirus vaccine:** Foundation funding supported the development of the first parvovirus vaccine, which has saved the lives of thousands of dogs.

**Prevention of and treatment for bladder stones:** Researchers developed a noninvasive technique for removing bladder and urethral stones in dogs, allowing for rapid recovery. In another study, scientists determined the genetic mutations that predispose certain breeds to bladder stones and developed a DNA-based test to identify high-risk dogs. Breeders can now use this test to prevent the mutation.

**Advanced treatment for heart conditions:** Scientists treated and permanently cured dogs with accessory pathways in the heart. Another study used a silicone cuff to treat portosystemic shunts, the second most common congenital cardiovascular abnormality in dogs.
<table>
<thead>
<tr>
<th>Study Title</th>
<th>Investigator</th>
<th>Institution</th>
<th>Award Year</th>
<th>Total Study Cost</th>
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<tbody>
<tr>
<td>Evaluating a New Treatment for Fractures in Dogs</td>
<td>Dr. Laurent P. Guiot</td>
<td>Michigan State University</td>
<td>D13CA-316</td>
<td>$113,913</td>
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<td>This study compares the outcomes associated with conventional repair of</td>
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<td>radius and ulna fractures in dogs with those of a new minimally invasive repair technique. Success rates, including healing times and complication rates, will be compared to evaluate the efficacy of each surgical treatment.</td>
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<td>Identifying Genes Associated with Cruciate Rupture in Labradors</td>
<td>Dr. Peter Muir</td>
<td>University of Wisconsin</td>
<td>D13CA-020</td>
<td>$160,038</td>
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<td>This study investigates the genetics of cruciate rupture in Labrador Retrievers. The specific genes associated with this condition have not been identified, although multiple genes are thought to influence risk. Once mutations are identified, a genetic test can be developed to allow for early identification of at-risk dogs and selective breeding to reduce disease in affected breeds.</td>
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<td>Evaluating Preventive Therapy for Ligament Disease</td>
<td>Dr. Siao Sia Goh</td>
<td>Colorado State University</td>
<td>D13CA-311</td>
<td>$84,305</td>
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<td>Cranial cruciate ligament disease is the most common cause of lameness and knee osteoarthritis in dogs. Dogs that injure a ligament on one side have a 60 percent chance of injuring the opposite knee within 18 months. This study investigates whether a minimally invasive therapy, in which stem cells are injected into at-risk knees, can prevent or slow cranial cruciate ligament disease.</td>
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<td>Evaluating a New Cell Therapy for Osteoarthritis in Dogs</td>
<td>Dr. Thomas G. Koch</td>
<td>University of Guelph, Canada</td>
<td>D13CA-313</td>
<td>$117,718</td>
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<td>An estimated 20 percent of adult dogs suffer from osteoarthritis. This study evaluates the use of current cell-based therapies, their effect on the immune system and their ability to generate cartilage. Information from this study will contribute to a greater understanding of cellular reprogramming and could be used to develop advanced treatments for repairing damaged tissue.</td>
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<td>Bone/Musculoskeletal</td>
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<td>Dogs</td>
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### Mapping Orthopedic Disease in Border Collies

Dr. Marjo K. Hytönen, University of Helsinki, Finland, Fellowship Training, D13CA-403

**Total Study Cost: $110,000**

Many breeds of large dogs develop osteochondritis dissecans, a developmental orthopedic disease. This study maps the genomic regions associated with this disease in Border Collies. Once these regions are identified, scientists can develop genetic tests for breeding purposes to reduce the incidence of the disease in the breed.

### Assessing Pain in Dogs with Osteoarthritis

Dr. Mila Freire, North Carolina State University, Fellowship Training, D13CA-406

**Total Study Cost: $110,000**

Chronic pain associated with osteoarthritis is difficult to effectively control, possibly because of the presence of central sensitization, a neurological process that intensifies pain. This researcher is developing methods to detect central sensitization in dogs with chronic osteoarthritis. The results of this work will improve the ability to assess and control chronic pain in dogs with osteoarthritis.

### Cancer

**Supporting the ACC Cancer Biology Program**

Dr. Rodney L. Page, Colorado State University, D05CA-500

**Total Study Cost: $1,265,000**

The ACC Cancer Biology Program is a multidisciplinary and multidisciplinary program designed to train new research scientists in the field of companion animal cancer. Graduates focus on causes and prevention, diagnostics, therapeutics and risk assessment.

"Golden Retrievers are wonderful dogs that have enriched the lives of so many people. Yet this breed continues to be plagued by a number of catastrophic cancers. Through your support, I am hopeful that the day will come when the number of Golden Retrievers presented to oncology clinics for cancer therapy is greatly reduced, in no small part due to the gains made through research that you have facilitated."

— Stuart C. Helfand, DVM, DACVIM
Oregon Health and Science University
Cancer

**MADGiC: Making Advanced Discoveries in Golden Cancers**

Drs. Jaime F. Modiano, Kerstin Lindblad-Toh and Matthew Breen, University of Minnesota, Uppsala University, Sweden, and North Carolina State University

**D10CA-501**

**Total Study Cost: $1,109,688**

Golden Retrievers have one of the highest incidences of cancer. Although breed susceptibility to cancer was first reported 30 years ago, the relationship between inherited traits and susceptibility for cancer is still not known. This multi-institutional study examines genetic traits that contribute to risk and progression of hemangiosarcoma and lymphoma in Golden Retrievers.

**Developing a New Delivery System for Lymphoma Treatment**

Dr. Nicola J. Mason, University of Pennsylvania, D12CA-026

**Total Study Cost: $119,380**

An effective drug for treating human lymphoma doesn’t work in dogs with blood cell lymphoma because it doesn’t bind to canine B cells. This study uses a novel system to develop a canine-derived antibody fragment that will recognize canine cancer cells and target malignant B cells. This therapy could allow for increased chemotherapy doses and reduced side effects for dogs with B-cell lymphoma.

**Evaluating a Novel Drug for Lymphoma**

Dr. Barbara Biller, Colorado State University, D12CA-033

**Total Study Cost: $104,695**

Lymphoma accounts for an estimated 25 percent of all canine cancers. This study investigates a new therapeutic antibody that appears to effectively kill canine lymphoma cells but does not appear to result in serious side effects. Researchers will work to find the best dosage and evaluate the drug’s safety and effectiveness in dogs with B-cell lymphoma.
Identifying the Genetic Landscape of Soft-Tissue Sarcomas
Dr. Marlene L. Hauck, North Carolina State University, D12CA-071

Total Study Cost: $113,823
This study uses next-generation gene-sequencing technology to identify genetic mutations responsible for soft-tissue sarcomas in dogs. This information will increase understanding of soft-tissue sarcoma development and lead to novel treatments as drugs are identified or developed to target these common mutations.

Understanding the Role of Specific Cells in Spreading Lymphoma
Dr. Daisuke Ito, University of Minnesota, First Award, D12CA-302

Total Study Cost: $118,800
One of the limitations in identifying therapeutic targets for canine lymphoma has been the lack of reliable systems to study lymphoma cells in the laboratory. This study uses a culture system, developed by the principal investigator, to maintain lymphoma cells in the laboratory and study a protein that helps lymphoma spread. The findings may highlight novel targets for developing therapies to treat B-cell lymphoma in dogs.

Evaluating the Behavior of Malignant Melanomas
Dr. Timothy J. Stein, University of Wisconsin, D13CA-030

Total Study Cost: $71,319
There is currently no long-lasting therapy for treating malignant melanoma in dogs. This study assesses two cell-signaling pathways to determine whether they interact and contribute to the aggressive behavior of malignant canine melanomas. This project provides valuable information on signaling pathways as potential therapeutic targets.

Studying How Mast Cell Tumors Spread
Dr. Cheryl A. London, The Ohio State University, D13CA-031

Total Study Cost: $105,047
Mast cell tumors (MCTs) are the most common skin tumors in dogs, and they are often fatal. Previous studies in dogs with aggressive tumors found that the small microRNA (miR-9) expressed in those tumors was more likely to spread and kill affected dogs. This study provides a molecular framework for understanding how tumors with miR-9 spread.

“Thank you again for your concern for our pets, your support, and your trust in us and Morris Animal Foundation to carry out this essential work.”
— George E. Moore, DVM, PhD
Purdue University
## Dogs

### Developing Ways to Improve Cancer Treatment

**Dr. Daniel L. Gustafson, Colorado State University, D13CA-044**

*Total Study Cost: $98,691*

Cancers are generally treated with the same chemotherapy drugs even though it is known that different cancers respond in different ways to different drugs. This study uses gene signature patterns to determine whether a cancer from an individual dog is more or less sensitive to a specific chemotherapy drug. If the researchers are successful, canine patients could be treated with the drug that would be most effective for their particular cancer.

### Identifying Bone Cancer Response to Treatment

**Dr. Dawn L. Duval, Colorado State University, D13CA-058**

*Total Study Cost: $120,577*

Canine osteosarcoma is a highly aggressive cancer, and despite treatment with surgery followed by chemotherapy, cancer often recurs in other bones or organs, particularly the lungs. This study identifies biomarkers that could indicate how bone cancer will respond to treatment. Results will serve as a basis of a prospective clinical trial to identify tailored chemotherapy treatments for patients.

### Determining a More Effective Treatment for Canine Lymphoma

**Dr. Jaime F. Modiano, University of Minnesota, D13CA-033**

*Total Study Cost: $161,400*

This study evaluates the efficacy of two antibodies that could treat canine B-cell lymphoma. The investigators theorize that either antibody alone will kill lymphoma cells and delay tumor progression but that the combined effect of the two antibodies will be more effective as a treatment for dogs with lymphoma.

### Identifying Ways to Make Bone Tumors Less Aggressive

**Dr. Jaime F. Modiano, University of Minnesota, D13CA-032**

*Total Study Cost: $293,912*

Researchers theorize that tumors with inactive tumor suppressor protein RB are highly aggressive, and those with active RB are less aggressive. Drugs that alter the structure and organization of DNA appear to restore RB function. This study assesses whether these drugs can convert highly aggressive canine bone tumors into less aggressive canine tumors that have a better prognosis.
**Veterinary advances for dogs**

**Assessing How a Protein Helps Hemangiosarcoma Cells Survive**

Dr. Erin B. Dickerson, University of Minnesota, D13CA-062

**Total Study Cost: $129,358**

Canine hemangiosarcoma is a common and highly fatal cancer in dogs. Recent evidence suggests that populations of cancer stem cells give rise to tumors, promote tumor growth and are the main culprits behind drug resistance and disease recurrence. This study examines how a protein expressed by stem cells contributes to the maintenance and survival of hemangiosarcoma stem cells.

**Discovering New Therapy Targets for Soft-Tissue Sarcomas**

Dr. William C. Kisseberth, The Ohio State University, D13CA-073

**Total Study Cost: $194,310**

Soft-tissue sarcomas are among the most common canine cancers. This study defines the molecular and clinical characteristics of these tumors in dogs. The information will help identify genes and pathways that will lead to new targeted therapies for dogs with soft-tissue sarcomas.

**Controlling the Spread of Hemangiosarcoma Cells**

Dr. Jong Hyuk Kim, University of Minnesota, Fellowship Training, D13CA-400

**Total Study Cost: $118,800**

Hemangiosarcoma is a common and fatal cancer that is particularly deadly to Golden Retrievers and Portuguese Water Dogs. This study examines how molecular signaling helps cancer stem cells undergo self-renewal. Investigators are evaluating the potential to control the activity of hemangiosarcoma stem cells by altering these molecular signals to slow tumor growth and to enhance sensitivity to conventional and targeted therapies.

**Developing a Noninvasive Technique to Determine Brain Tumor Type**

Dr. Jennifer M. Gambino, Mississippi State University, Pilot Study, D13CA-821

**Total Study Cost: $11,880**

This study uses an advanced magnetic resonance imaging technique—magnetic resonance spectroscopy—to evaluate noninvasive methods of determining brain tumor type in dogs. Investigators expect that this technology will improve management of brain tumor cases and replace invasive tissue sampling in the brain and elsewhere in the body.

“I firmly believe that what we will learn from this project will open up a new avenue of treatment for dogs with lymphoma that will be both safe and effective and will take us a step closer to helping animals and people fight cancer with dignity.”

— Barbara Biller, DVM, PhD
Colorado State University
**Eye Disorders**

**Identifying Genetic Mutations for Cataracts in Australian Shepherds**

Dr. Sally Ricketts, Animal Health Trust, First Award, D10CA-303

*Total Study Cost: $62,193*

Australian Shepherds have an increased risk of developing hereditary cataracts, the most common eye disease leading to blindness in purebred dogs. This study investigates the genetic basis of hereditary cataracts in Australian Shepherds, but the findings may also be applicable to other high-risk breeds, including Golden Retrievers, German Pointers, Siberian Huskies and American Cocker Spaniels.

**Assessing a Diagnostic Tool for Eye Diseases**

Dr. Chris G. Pirie, Tufts University, Pilot Study, D13CA-802

*Total Study Cost: $8,701*

This study assesses the capabilities of a camera adapter used to diagnose and treat human eye diseases to determine how well it performs a diagnostic technique in canine eyes. Validation of this new technology could enhance diagnostic and therapeutic capabilities, thereby improving the outcome for dogs with eye diseases.

**Genetics**

**Analyzing Causes of Behavioral Changes in Belgian Malinois**

Dr. Anita M. Oberbauer, University of California–Davis, D12CA-054

*Total Study Cost: $201,454*

Belgian Malinois can experience seizures and severe behavioral changes that lead to euthanasia because the dogs become a threat to humans and other dogs. This study is looking for the specific gene mutation responsible for these health and aggressive behavior issues. The long-term goal is to develop a genetic test for breeders and veterinary professionals.

**Heart/Cardiovascular**

**Identifying the Genetic Mutation for a Heart Defect**

Dr. Joshua A. Stern, Washington State University, Fellowship, D09CA-909

*Total Study Cost: $176,000*

Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. This fellow is identifying a genetic mutation that causes a fatal congenital heart defect in Golden Retrievers.
Identifying Genetic Markers for a Congenital Heart Disorder in Newfoundlands

Dr. Kathryn M. Meurs, North Carolina State University, D13CA-041

Total Study Cost: $46,529

Subvalvular aortic stenosis, the most common congenital heart disorder in dogs, is particularly common in Newfoundlands. This study looks for a causative genetic mutation for subvalvular aortic stenosis in Newfoundlands. Identification of a causative mutation or marker will help researchers develop a genetic screening test to reduce disease prevalence in Newfoundlands and other at-risk breeds.

Identifying Genetic Markers for a Congenital Heart Disorder in Dogs

Dr. Kathryn M. Meurs, North Carolina State University, D13CA-071

Total Study Cost: $47,717

Subvalvular aortic stenosis, the most common congenital heart disorder in dogs, is particularly common in Rottweilers and Golden Retrievers. This study looks for a causative genetic mutation for subvalvular aortic stenosis in these breeds, which will help researchers develop a genetic screening test to reduce disease prevalence in other at-risk breeds.

Developing a New Technique to Study Canine Heart Disease

Dr. Carla M. Lacerda, Colorado State University, First Award, D12CA-309

Total Study Cost: $118,800

Myxomatous mitral valve disease (MMVD) is the most prevalent heart disease in dogs and the most common cause of heart failure. This research tests whether strain on the mitral valves causes proteins and other factors to kickstart MMVD. Data collected from this study could yield new insights into the development of MMVD, validate a new model to study the disease process and identify new therapeutic strategies.

“Your generous donation makes this work possible, and we are extremely grateful for your support. We believe this new technology will open up a number of possibilities for treating different diseases in dogs.”

— Nicola Mason, BVetMed, PhD, DACVIM
University of Pennsylvania
Using the Demographics of Dog Populations to Prevent Rabies

Dr. Darryn Knobel, University of Pretoria, South Africa, First Award, D12CA-312

Total Study Cost: $115,935

This research establishes a health and demographic surveillance system for dogs in a rabies-infected area in South Africa, which will then be used to better understand the demographics of the dog population. This system will improve rabies control, create a platform to accurately measure rates of other diseases in the dog population, identify determinants of dog health and welfare, and assess interventions aimed at improving health and welfare.

Identifying Healthy Bacteria on Canine Skin

Dr. Timothy J. Johnson, University of Minnesota, D13CA-037

Total Study Cost: $118,799

This study identifies the healthy bacteria living on the skin of dogs. The information gathered will be used to better understand how the household environment and the skin microenvironment influence the composition of skin bacteria. The study will provide a foundation for future studies on how healthy bacteria protect dogs against common diseases such as atopic dermatitis.

Comparing Aspirin and Heparin in Treating Dogs with IMHA

Dr. David J. Polzin, University of Minnesota, D10CA-026

Total Study Cost: $176,631

Immune-mediated hemolytic anemia (IMHA), a common form of severe anemia in dogs, is associated with high mortality rates. This study determines whether low-dose aspirin or individually adjusted heparin therapy is more effective in treating and enhancing survival in dogs with IMHA.

Assessing the Incidence of Leishmaniasis

Dr. Kevin Esch, Iowa State University, Fellowship, D09CA-911

Total Study Cost: $176,000

Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. This fellow is assessing the overall incidence of leishmaniasis, a fatal parasitic disease transmitted by sand flies, and the effectiveness of prevention measures to curb the disease.

"We sincerely thank you for helping us to achieve excellence. It is support from donors like you that allows us to pursue research projects that directly benefit shelter animals."

— Gabriele Landolt, DVM, PhD, DACVIM
Colorado State University

Immunology/Infectious Disease

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Colorado State University
Metabolic
Assessing Therapeutic Targets for Adrenocortical Tumors
Dr. Miriam J. Kool, University of Utrecht, The Netherlands, Fellowship, D09CA-913
Total Study Cost: $176,000
Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. This fellow is looking at new therapeutic targets for medical treatment of cortisol-secreting adrenocortical tumors, which cause Cushing’s disease, one of the most common canine endocrine disorders.

Understanding the Genetic Basis for Urinary Stones
Dr. Edward E. Patterson, University of Minnesota, D12CA-031
Total Study Cost: $180,215
Urinary stones are common in dogs, especially Miniature Schnauzers, which have a higher risk than other breeds. This study evaluates the DNA from Miniature Schnauzers and seven other breeds at high risk for developing urinary stones: Yorkshire Terriers, Lhasa Apsos, Bichon Frises, Shih Tzus, Pomeranians, Malteses and Miniature Poodles. If genetic variations are identified, results will be used to develop a screening test.

“Your donation and support of our project will have a positive effect on the quality of life of many dogs. I very much appreciate your support of this important project.”
— Brian C. Gilger, DVM, DACVO
North Carolina State University

Developing a New Model to Study Canine Influenza Virus
Dr. Elizabeth Driskell, University of Illinois, Pilot Study, D13CA-807
Total Study Cost: $11,766
This researcher is developing a new technique to culture canine respiratory tissues that will be used to study canine influenza virus. Once developed, this model could be used to increase the sensitivity of tests to detect the virus in pet and shelter dogs, thereby improving surveillance and the ability to detect viral changes that make vaccines ineffective.
**Metabolic**

**Testing Higher Doses of a Drug to Combat Kidney Disease**

Dr. Barrak M. Pressler, The Ohio State University, D12CA-053

**Total Study Cost: $167,297**

About one in five dogs develops kidney disease, and about half of those cases may be caused by proteinuria glomerular diseases or urinary protein excretion diseases. The mainstay of glomerular disease treatment is enalapril. Although there is an established dose of enalapril for dogs, this study evaluates whether higher doses could dramatically improve patient survival.

**Testing a Drug for Preventing Urinary Tract Infections**

Dr. Michael W. Wood, North Carolina State University, First Award, D12CA-321

**Total Study Cost: $36,208**

About 14 percent of all dogs will develop a urinary tract infection (UTI) during their lifetime, and about 5 percent of these dogs will have recurrent infections. This study evaluates a drug commonly used to treat arthritis in dogs for its ability to help block infection and prevent future UTIs.

**Examining Better Diagnostics for Renal Disease**

Dr. Jessica Hokamp, Texas A&M University, Fellowship, D12CA-903

**Total Study Cost: $176,000**

Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. Chronic kidney disease, a common cause of morbidity and mortality in dogs, affects up to 15 percent of older dogs. This fellow is examining less invasive diagnostic methods to detect renal disease and to more effectively monitor disease progression.

**Neurology**

**Treating Canine Paralysis with Stem Cells**

Dr. Natasha J. Olby, North Carolina State University, D10CA-040

**Total Study Cost: $297,578**

Most dogs who suffer from a severe spinal fracture that causes paralysis of the hind legs and loss of sensation will remain permanently paralyzed. This clinical study compares three different therapies in chronically paraplegic dogs, including transplantation of stem cells derived from the patient. The results may provide a new way to treat paralyzed dogs.

"Your commitment to helping fund animal health studies that will give animals longer, healthier lives is essential to the advancement of veterinary medicine."

— Cheryl A. London, DVM, PhD

The Ohio State University
Developing Stem Cells to Treat Spinal Cord Injuries
Dr. Jose Cibelli, Michigan State University, D12CA-066

Total Study Cost: $106,322

Up to 2 percent of the dogs admitted to the hospital arrive with a spinal cord injury, and 77 percent of these injuries are due to intervertebral disc disease. Currently, there is no restorative treatment for these dogs. This study investigates the use and safety of canine-induced pluripotent stem cells as a treatment for canine spinal cord injuries.

Assessing Recovery After Spinal Cord Injury
Dr. Sarah A. Moore, The Ohio State University, D13CA-024

Total Study Cost: $38,623

This study evaluates three sensory motor tests in dogs with spinal cord injuries. Investigators will first determine normal baseline values for each test and then evaluate each test in dogs with injuries to determine whether results correlate with the severity of clinical signs and whether the condition improves as dogs undergo treatment.

Developing a Better Tool for Assessing Bloat Prognosis
Dr. Elizabeth A. Rozanski, Tufts University, D09CA-502

Total Study Cost: $80,417

Researchers are developing prognostic tools that will help veterinarians more accurately assess dogs that develop bloat. Knowing which dogs have an increased risk for death or a prolonged hospital stay from bloat is vitally important so that veterinarians can identify those animals in need of more aggressive care.

Investigating a Noninvasive, At-Home Diagnostic Technique for Gastrointestinal Disorders
Dr. Pedro L. Boscan, Colorado State University, D10CA-016

Total Study Cost: $90,344

Gastrointestinal disorders are common in dogs and are often associated with a change in the rate food moves through the stomach and intestines. This study uses a noninvasive, wireless sensor capsule to determine the gastrointestinal transit in dogs. The information will help veterinarians to better diagnose gastrointestinal diseases, including bloat, gastritis and inflammatory bowel disease, while dogs are in their home environment.
Identifying the Cause of Emerging Gallbladder Disease in Dogs

Dr. Jody L. Gookin, North Carolina State University, D12CA-044

Total Study Cost: $57,372

Dogs can develop gallbladder mucocele, a condition in which the gallbladder becomes obstructed with a large mass of congealed content, presumably mucus, which sometimes results in rupture of the gallbladder. Veterinarians do not know why dogs develop mucoceles or what the congealed mass is made of. This study investigates the underlying cause of gallbladder mucocele formations.

Evaluating Contributors to Obesity in Dogs

Dr. Daisy J. X. Liu, Ghent University, Belgium, Fellowship Training, D13CA-405

Total Study Cost: $110,000

Obesity leads to such health complications as diabetes, orthopedic problems and hypertension in dogs. This study evaluates how gastrointestinal microbiota contribute to obesity in dogs. The findings will be beneficial to companion dogs that are prone to becoming overweight or obese, such as Beagles, Labradors and Golden Retrievers.

Evaluating a New Approach to Control Dog Overpopulation

Dr. Pawan Puri, University of Pittsburgh, Pilot Study, D13CA-820

Total Study Cost: $11,778

Testicular stem cells are critical to maintaining fertility in male dogs. Investigators have identified a protein that is essential for maintaining testicular stem cells and will determine whether inhibiting this protein will eliminate stem cells in testes. If successful, this approach will provide a new avenue to address the problem of overpopulation of stray dogs.

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Veterinary advances for cats and dogs

Cancer

Understanding Early Cell Changes That Contribute to Cancer

Dr. Alex Davies, University of California–Davis, Fellowship, D10MS-906

Total Study Cost: $176,000

Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. This fellow is focusing on early changes in stem cells that contribute to the formation of cancer stem cells. Results will be used to identify new therapies that block cancer progression.

Examining the Role of Stem Cells and Genes in Mammary Tumor Development

Dr. Gerlinde R. Van de Walle, Ghent University, Belgium, D12MS-002

Total Study Cost: $107,422

Mammary tumors are among the most common cancers in female dogs and cats, and they have a high incidence of recurrence and development into metastatic disease. This study examines changes in a tumor suppressor gene linked to tumor development and aggressiveness of breast cancer in humans. A better understanding of this gene’s role in the development of cancer in dogs and cats may lead to new and more effective cancer therapies.

Metabolic

Funding the Oklahoma State Residency and Training Program

Dr. Michael Lorenz, Oklahoma State University, D08MS-500

Total Study Cost: $428,346

This program’s goal is to increase the number of veterinary clinical specialists trained for successful academic and research careers. The research portion of the training focuses on novel drug treatments for feline diabetes.
Pain Management/Pharmacology

Studying an Analgesic Drug Therapy in Animals

Dr. Kristen M. Messenger, North Carolina State University, Fellowship, D10MS-910

Total Study Cost: $176,000

Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. This fellow is examining how individual dogs respond to different analgesic drugs. The goal is to help create tailored pain-management therapies that are effective and have the fewest side effects.

Metabolic

Identifying Factors in Obesity Development

Dr. Lori Donna Gutzmann, University of Missouri, Fellowship, D12MS-900

Total Study Cost: $176,000

Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. An estimated 20 to 40 percent of dogs and cats are overweight or obese. Neutering contributes to body weight gain in dogs and cats, but the amount of weight gained by each animal varies. This fellow is focusing on identifying factors and predictive biomarkers that lead to weight gain after neutering.

“Without financial support from generous people interested in the well-being of animals, my work would be impossible, and veterinary medicine would surely not advance to where it should be, or anywhere near the standard of human medicine.”

— Elizabeth A. Ballegeer, DVM, DACVR
Michigan State University

Cats and Dogs
Since 1959, Morris Animal Foundation has been caring for horses, investing in more than 365 equine health studies for a total of more than $13 million. Here are some of the significant health advances that have occurred for horses because of our funding.

**Genetic discoveries:** Studies helped scientists sequence the equine genome and develop genetic tools to identify the causes of inherited diseases such as polysaccharide storage myopathy (PSSM, a form of tying-up), cribbing, lordosis and others. Another series of Foundation-funded grants helped researchers determine that recurrent exertional rhabdomyolysis (another form of tying-up) is inherited in thoroughbreds.

**Tests for inherited diseases:** Research led to tests that detect carriers of lavender foal syndrome and combined immunodeficiency disease, thereby helping to prevent these serious equine diseases.

**Nutritional management of muscle cramping:** Funding led to better management of PSSM through nutrition and exercise. The studies also determined that type 1 PSSM is genetic.

**Pain relief options for horses:** Several studies proved the effectiveness of acupuncture, electroacupuncture and the use of catheters to alleviate pain in horses. Researchers also learned that a commonly used pain reliever impedes the intestinal repair process in horses that have undergone colic surgery, indicating that the drug should be used sparingly.

Morris Animal Foundation has pledged more than $400,000 for equine health studies this year alone. Your sponsorship gift of $3,000 or more is critical to ensuring that we can fund future studies.
Assessing the Use of Stem Cells in Regenerative Therapies

Dr. Lawrence C. Smith, University of Montreal, Canada, D10EQ-056

**Total Study Cost: $110,484**

Because adult horses have a limited ability to repair injuries to muscles, bones and joints, there is growing interest in stem cell–based regenerative medicine to improve healing. This study focuses on induced pluripotent stem cells from adult horses. These cells can be genetically reprogrammed to an embryonic stem cell–like state that may allow them to be used in developing new regenerative therapies for horses.

Testing the Effectiveness of a Melanoma Vaccine in Horses

Dr. Jeffrey C. Phillips, Lincoln Memorial University, D12EQ-037

**Total Study Cost: $103,788**

Melanomas are among the most common tumors in horses. They occur in all breeds and colors of horses and are especially common in grey horses. This study evaluates a vaccine currently used to treat melanomas in dogs for its safety and effectiveness in treating melanomas in horses.
Immunology/Infectious Disease

Evaluating How Maternal Antibodies Protect Foals
Dr. Allen E. Page, University of Kentucky, Fellowship, D09EQ-908

Total Study Cost: $176,000

Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. This fellow is evaluating the ability of maternal antibodies to protect recently weaned foals against equine proliferative enteropathy (EPE), an emerging intestinal disease. Research focuses on *Lawsonia intracellularis*, a type of bacteria that causes EPE.

Evaluating the Mechanisms That Cause Heaves
Dr. Margaret E. Wilson, Michigan State University, Fellowship, D09EQ-910

Total Study Cost: $176,000

Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. This fellow is investigating the mechanisms of recurrent airway obstruction (RAO), also known as heaves. RAO is a lifelong chronic asthmalike condition that can affect all breeds of horses after exposure to hay and straw.

Evaluating Immune Responses to *Rhodococcus equi*

Dr. Stephen A. Hines, Washington State University, D10EQ-046

Total Study Cost: $219,102

*Rhodococcus equi* is a bacterium that is found in soil and causes life-threatening pneumonia in foals. Previous Foundation support helped define which immune responses a vaccine needs to elicit to be effective. In this study, the researchers are investigating the processes involved in immunity to *R. equi* and testing a novel immunization method to help prevent the disease in foals.
**Immunology/Infectious Disease**

**Determining Whether a Mare’s Antibodies Can Protect a Foal Against *Lawsonia intracellularis***

Dr. David W. Horohov, University of Kentucky, D12EQ-014

**Total Study Cost: $58,882**

*Lawsonia intracellularis* is a bacterium that causes severe intestinal disease in foals. Using blood samples from mares and their foals, this researcher is examining the role that the mare’s immunity may play in the foal’s immunity to *Lawsonia intracellularis*.

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**Understanding the Genes That Play a Role in Herpesvirus Infection**

Dr. Douglas F. Antczak, Cornell University, D12EQ-026

**Total Study Cost: $110,000**

Equine herpesvirus type 1 (EHV-1) is a threat to horses worldwide, causing abortions and neurological disorders. The researcher is looking at the interaction between normal cells and EHV-1 to examine how the virus gains entry into the cells of the immune system. A better understanding of the first steps of virus infection will lead to improved methods to control and treat EHV-1 infection.
Horses that experience equine metabolic syndrome, also known as Cushing’s syndrome, are more likely to develop laminitis, a crippling condition that may lead to euthanasia. This study looks at changes in the way the cells within the layers of the hoof communicate, specifically the cells that detach in laminitis, and the role of specific genes during the disease process.

"We are excited that our work is contributing to a fundamental understanding of equine digital laminae structure and regulation. We hope it will also contribute to the development of new therapeutic options for laminitis."

— Samuel J. Black, PhD
University of Massachusetts
Neurology

Searching for a Genetic Defect Responsible for Central Nervous System Disease

Dr. Carrie J. Finno, University of Minnesota, Fellowship Training, D12EQ-401

Total Study Cost: $110,000

This study investigates potential genetic and environmental causes for two of the most common equine brain and spinal cord diseases: neuroaxonal dystrophy and equine degenerative myeloencephalopathy. Results may lead to more accurate diagnostic tools and allow breeders to evaluate the status of their animals before breeding.

Welfare

Developing Strategies to Address the Unwanted Horse Problem

Dr. Krishona L. Martinson, University of Minnesota, D12EQ-500

Total Study Cost: $84,786

This study documents the reasons horses become unwanted and the true costs of caring for these unwanted animals. This information will be used to develop strategies for educational efforts, interventions and distribution of resources to address this growing welfare issue.

"Thank you once again for your support of this study. I am very optimistic that this research will be the start of a series of studies aimed at improving the health and quality of life of older horses."

— Kristine Urschel, PhD
University of Kentucky
Veterinary advances for wildlife

Since 1967, Morris Animal Foundation has been caring for wildlife, investing in nearly 500 wildlife health studies for a total of nearly $16 million. Here are some of the significant health advances that have occurred for wildlife because of our funding.

**Veterinary care for mountain gorillas:** Establishment of and funding for the Mountain Gorilla Veterinary Project provided emergency veterinary care to highly endangered mountain gorillas, which helped ensure the species’ survival and led to increases in their population numbers.

**Reproductive successes:** Researchers established a sperm genome resource bank for highly endangered Namibian cheetahs and protocols that allow wildlife veterinarians to use assisted reproductive technologies without having to move wild animals from their natural habitat. Scientists developed assisted breeding protocols that resulted in the world’s first endangered amphibians produced by in vitro fertilization and then released into the wild. Foundation funding helped develop artificial insemination protocols that resulted in the births of pandas in captivity.

**Improved rehabilitation for wild animals:** Research led to treatment modifications for sea turtles and seabirds suffering from red tide intoxication, which causes serious injuries and death. In another study, researchers developed a tool that monitors stress in injured owls undergoing rehabilitation, improving their well-being during the rehabilitation process.

**Legislative protection for endangered species:** Multiple studies led to state legislation that increased protections for endangered California sea otters. A study influenced legislation in Argentina when results showed that native ducks were being harmed by the amount of lead shot contaminating their habitat after each hunting season.

**Pain control for captive species:** Research studies determined how to control pain in fish and determined appropriate medications and dosing levels for managing pain in turtles, bearded dragons and parrots. Another study developed a unique way to administer pain medications to wild cats in captivity.

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Morris Animal Foundation has pledged $1.1 million for wildlife health studies this year alone. Your sponsorship gift of $3,000 or more is critical to ensuring that we can fund future studies.
**Wildlife**

**Aquatic Life**

**Identifying Potential Treatment for Fungus That Kills Amphibians**

Dr. Lisa K. Belden, Virginia Tech, D10ZO-028

**Total Study Cost: $69,489**

Amphibian populations are declining because of a fungus that attacks the skin. Amphibians naturally host an array of bacteria on their skin, many of which have antifungal properties. This study identifies beneficial types of bacteria on the skin of three amphibian species to determine if these bacteria can be used to prevent fungal infections in amphibians threatened by disease outbreaks.

**Identifying Genes That Help Amphibians Fight Deadly Fungus**

Dr. Lee F. Skerratt, James Cook University, Australia, D10ZO-046

**Total Study Cost: $109,189**

Chytridiomycosis, a disease caused by a fungus that is impossible to get rid of, has caused the decline or extinction of hundreds of frog species worldwide. This study identifies resistant genes that may provide immunity to the disease and investigates their potential use in breeding immune frogs and developing vaccines.

**Examining Whether Trade of Ornamental Amphibians Introduces Toxins to Wild Populations**

Dr. Trenton W. J. Garner, Zoological Society of London, United Kingdom, D12ZO-002

**Total Study Cost: $128,307**

As many as 41 percent of amphibian species are threatened by a fungus suspected to be globally spread by the amphibian trade. In this study, researchers are surveying imports for evidence of infection. They will determine whether retailers in Europe are selling amphibians that harbor infections and whether the fungus in wild European populations is correlated with the introduction of ornamental amphibian species.
Assessing the Effects of Oil and Oil Dispersants on Oysters
Dr. Sylvain De Guise, University of Connecticut, D12ZO-041

Total Study Cost: $114,238

The explosion of the Deepwater Horizon oil rig resulted in an unprecedented release of oil and oil dispersant into the Gulf of Mexico. This study examines adverse health effects of oil and oil dispersant in Eastern oysters. The data will help wildlife managers and officials make informed decisions regarding dispersant use in the event of future oil spills.

Understanding Impacts of Reproductive Chemicals on Fish
Dr. Edward F. Orlando, University of Maryland, D12ZO-046

Total Study Cost: $123,467

Aquatic ecosystems contain pollutants that can affect the reproductive development and health of fish. This study will determine how these pollutants affect wild fish populations. The data will help officials make informed choices on regulating use and disposal of chemicals into waterways.

Measuring Hormones That Affect Recovery in Stranded Sea Turtles
Dr. Kathleen E. Hunt, New England Aquarium, D13ZO-022

Total Study Cost: $136,296

This project measures the levels of stress and metabolic hormones in endangered Kemp’s Ridley sea turtles that experience cold stunning, a hypothermic-like condition that causes stranding. Pilot study data suggest that levels of these hormones are related to an animal’s ability to recover from cold stunning, so accurate measurement of these hormones will improve the ability to assess stress, treat associated symptoms and increase rates of recovery.
Investigating the Effects of Red Tides in Marine Animals

Dr. Kelly Sullivan Kirkley, Colorado State University, Pilot Study, D13ZO-824

Total Study Cost: $11,880

Domoic acid is a toxin produced during algal blooms that, when ingested by marine mammals, can lead to tremors and seizures. This study assesses how domoic acid produces neurological problems in California sea lions. Identifying the mechanisms by which domoic acid induces seizures could lead to the development of new treatments for seizures in many animals.

Examining the Link Between Lead Exposure and Poor Health

Dr. Marcela M. Uhart, Wildlife Conservation Society, D10ZO-021

Total Study Cost: $119,018

In Argentina more than 10 tons of lead gunshot is introduced into the environment every year, some of which is ingested by native ducks. This study quantifies the relationship between lead exposure and the health of native ducks and other wetland species in Argentina and measures the extent of lead exposure in this ecosystem.

Surveying Bat Populations to Gauge Disease Risks

Dr. Thomas H. Kunz, Boston University, D10ZO-048

Total Study Cost: $216,435

White-nose syndrome, which is linked to a cold-loving fungus and thought to be transmitted between bats, has caused unprecedented mortality in bats. This study surveys the genetic diversity and dispersal of little brown bats to help predict the bats’ migration routes and identify other bat populations at risk.
Developing a Tool to Detect Illness in Raptors Without Clinical Signs

Dr. Lisa A. Tell, University of California–Davis, D12ZO-026

Total Study Cost: $72,239

Early detection of many conditions that affect raptors is often difficult because birds don't show behavioral changes until they are severely ill. Researchers are developing a new diagnostic tool to detect health problems in raptors before they exhibit signs of illness. This new tool will help wildlife, zoo and avian veterinarians differentiate healthy birds from those with traumatic injuries or infections.

Evaluating Effects of Persistent Environmental Contamination on Birds

Dr. Sonia M. Hernandez, University of Georgia, D12ZO-024

Total Study Cost: $58,903

In the late 1990s, contaminated sediment was removed from a Superfund toxic waste site in Brunswick, Georgia, yet investigators continue to find high concentrations of toxic materials in birds in the area. This study evaluates the effects of persistent environmental contaminants on health and breeding success in least tern seabirds.

Evaluating Diagnostic Tests for a Fatal Gastrointestinal Disease in Parrots

Dr. Shuping Zhang, Texas A&M University, D13ZO-016

Total Study Cost: $107,342

Proventricular dilatation disease (PDD) is a fatal gastrointestinal disease of parrots that is caused by a viral infection. This study looks at the advantages and limitations of each currently available diagnostic test to create reference samples for evaluating PDD diagnostic tests. Information gained will lead to the formulation of an effective and reliable diagnostic test for PDD, thereby improving the management of birds infected with and exposed to this disease.

“Over the last year we have had a number of important breakthroughs in our studies. Our findings continue to be interesting and exciting, and we are very grateful to you for making this work possible.”

— Tracey Goldstein, PhD
University of California–Davis
Wildlife

**Birds/Bats**

**Improving Methods for Studying White-Nose Syndrome in Bats**

Dr. Shamus P. Keeler, University of California–Davis, Fellowship Training, D13ZO-414

**Total Study Cost: $103,510**

White-nose syndrome is a devastating disease of North American bats that is caused by a fungal pathogen. This project looks at methods for improving the growth and maintenance of fungal cultures in the laboratory. This will allow researchers to further study the disease process and test potential treatments.

**Elephants/Rhinos**

**Testing a Treatment That Could Increase Fertility in Elephants**

Dr. Janine L. Brown, Smithsonian Institution, D12ZO-057

**Total Study Cost: $36,333**

The African elephant population in U.S. zoos is not self-sustaining, due in part to poor reproduction. This study tests a drug that may help regulate female elephants with abnormal ovarian cycles. If successful, the drug will help establish new treatments for infertility in African elephants.

“The project team, the Fort Worth Zoo and I are grateful for the generous support of people and organizations like yours who have a concern for the future of elephants.”

— Michael Fouraker
Fort Worth Zoo
Evaluating Buffalo Health to Help Endangered Rhino Populations

Dr. Kurnia O. Khairani, Cornell University, Fellowship Training, D12ZO-411

Total Study Cost: $110,000

The Indonesian government is creating a second population of the critically endangered Javan rhinoceros; however, the proposed site is surrounded by domesticated water buffalo that could pose a significant health risk to the endangered rhinos. This study evaluates the prevalence of hemorrhagic septicemia, an endemic disease affecting the region’s water buffalo. The results will improve the health of the resident water buffalo and the endangered rhinos.

Multiple Species

Determining Whether Translocation of Wildlife Spreads Diseases

Dr. Ellen R. Schoener, Massey University, New Zealand, Pilot Study, D13ZO-811

Total Study Cost: $10,450

Relocation of endangered species can expose the reintroduced and native species to new disease-causing agents. This ecology of disease introduction will be examined in the New Zealand saddleback bird, which has a well-documented translocation history. This study aims to improve baseline data for diagnosis, preventive measures and management for possible disease outbreaks.
Multiple Species

Identifying Safer Methods for Administering Anesthesia in Wildlife

Dr. Åsa I. Fahlman, Swedish University of Agricultural Sciences, Sweden, First Award, D13ZO-317

Total Study Cost: $106,808

This study evaluates two common complications of wildlife anesthesia: hypoxemia and hypercapnia. The investigators will test whether oxygen supplementation can prevent low levels of oxygen in the blood (hypoxemia). They will also evaluate the efficacy of a portable ventilation device for preventing high levels of carbon dioxide in the blood (hypercapnia). Identifying safer methods of administering anesthesia will benefit captive and free-ranging wildlife.

“Conducting cutting-edge research in veterinary species is an expensive process that attracts little support from most granting agencies; thus the work of the Morris Animal Foundation, and your support of the Foundation via your gift, are critical to the longer term development of veterinary medicine.”

— Craig G. Ruaux, BVSc, PhD, DACVIM
Oregon State University

Primates

Identifying Factors Contributing to Mycobacterium tuberculosis in Great Apes

Dr. Tiffany M. Wolf, University of Minnesota, Fellowship, D10ZO-902

Total Study Cost: $176,000

Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. This fellow is focusing on the risks of transmitting tuberculosis from humans to habituated chimpanzees. The study will lead to the development of a noninvasive tuberculosis screening test for chimpanzees and other primates and a disease model to identify necessary conditions for disease transmission.
Reptiles
Assessing the Prevalence of a Disease-Causing Pathogen in Tortoises

Dr. Michael J. Yabsley, University of Georgia, D13ZO-015

Total Study Cost: $14,223

This study surveys a population of gopher tortoises for the prevalence of a pathogen that causes upper respiratory tract disease. Information gained from this study will illustrate how a particular disease affects a gopher tortoise population over time and will provide information about the behavior of diseased tortoises. Results can then be used to help state and federal agencies make decisions regarding translocation of sick or previously exposed tortoises.

Wild Cats
Developing a Tool to Detect Tuberculosis in Lions

Dr. Michele A. Miller, Palm Beach Zoo, D10ZO-039

Total Study Cost: $72,468

When lions prey on infected animals they can contract diseases, such as bovine tuberculosis (BTB), and transmit them to other lions. This study investigates the use of a new blood-based field test to detect BTB infection in lions. Understanding methods of transmission and detecting BTB infection before clinical signs develop are crucial to developing effective management and conservation strategies for lions.

Examining the Digestive Microbiology of Captive Cheetahs

Dr. Anne A. M. J. Becker, Ghent University, Belgium, Fellowship Training, D12ZO-404

Total Study Cost: $116,727

Inappropriate feeding may contribute to the development of gastrointestinal and metabolic diseases in captive cheetahs. This study uses noninvasive sampling to better understand the intestinal microbiota of cheetahs and their relationship to cheetah health. Data will be used to develop better feeding strategies for prevention of disease in cheetahs.

“I would like to express my deep gratitude to you for sponsoring my research through the Morris Animal Foundation. Through this program, I am training for a career in public health and wildlife conservation. This would not be possible without donors like you.”

— Julie L. Rushmore, BSc
University of Georgia
Wild Cats

Managing the Spread of Canine Distemper Virus to Siberian Tigers

Dr. Dale Miquelle, Wildlife Conservation Society, D13ZO-041

Total Study Cost: $152,543

Canine distemper virus (CDV), which infects domestic and wild carnivores, is a known cause of mortality in Siberian tiger populations. This project will identify the species responsible for maintaining CDV infection and transmitting it to tigers. This identification is critical for designing appropriate interventions and will help researchers evaluate approaches to disease control.

Evaluating Chronic Kidney Disease in Captive Nondomestic Felids

Dr. Jacqui M. Norris, University of Sydney, Australia, D13ZO-078

Total Study Cost: $47,758

This study identifies factors predisposing animals to the development of chronic kidney disease (CKD); characterizes the types of CKD observed in captive nondomestic cats in Australian zoos; compares the prevalence, progression and type of CKD seen in each species and zoo; and identifies reasons for the differences seen. The data will help researchers develop protocols for early diagnosis and prevention.

“Thank you again for helping make this project possible, and for believing that wildlife research projects are deserving of financial support.”

— Raina Plowright, BVSc, PhD
Pennsylvania State University
Measuring the Effects of Feline Immunodeficiency Virus on African Lions

Dr. Heather M. Broughton, Oregon State University, Fellowship Training, D13ZO-420

Total Study Cost: $105,895

This study assesses the immunologic and clinical effects of feline immunodeficiency virus (FIV) infection on free-ranging lions. This fellow will also assess the impact of coinfections of FIV and other pathogens. Results from this study will provide a direct measure of the immunosuppressive and health effects of FIV in African lions and will illuminate its role in the development of secondary infections.

Investigating Innate and Adaptive Immune Responses of Bighorn and Domestic Sheep

Dr. Margaret A. Highland, Washington State University, Fellowship, D09ZO-914

Total Study Cost: $176,000

Pfizer Animal Health—Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. This fellow is investigating the basic immune functions and systems in bighorn sheep and comparing them to those of domestic sheep. The project focuses on pneumonia, which is transmitted to bighorn sheep by domestic sheep and is the leading cause of the dramatic decline of North American bighorn sheep.
Wildlife

Wild Hooved Animals/Ruminants

Evaluating a Fertility Vaccine to Humanely Control Wild Horse Populations

Dr. Terry M. Nett, Colorado State University, D10ZO-034

Total Study Cost: $110,092

This study evaluates a contraceptive vaccine to induce infertility in female wild horses. If successful, this vaccine could provide a humane, safe and effective tool for managing free-ranging wild horses on public rangelands.

Evaluating Disease Risk in African Buffalo

Dr. Brianna R. Beechler, Oregon State University, Fellowship Training, D12ZO-409

Total Study Cost: $101,845

Governments in southern African countries have begun taking down boundary fences, which may increase disease spread from livestock to wildlife. This study monitors African buffalo for bovine tuberculosis and Rift Valley fever at the wildlife-livestock boundary in Kruger National Park, South Africa. A better understanding of these emerging diseases in African buffalo will enable more comprehensive disease-risk assessments and more informed policy decisions.

Understanding Burkholderia Infections for Vaccine Development

Dr. Shawn M. Zimmerman, University of Georgia, Fellowship, D12ZO-902

Total Study Cost: $176,000

Pfizer Animal Health–Morris Animal Foundation Fellowships provide funding for scientists and veterinarians to receive advanced scientific training. This fellow is working to better understand the pathogenesis of glanders and melioidosis, fatal bacterial infections that cause severe pneumonia and sepsis in solipeds (horses, ponies, donkeys and mules). This work provides the initial steps toward the development of a vaccine against these infections.
Determine Risk for Developing Chronic Wasting Disease

Dr. Timothy D. Kurt, University of California–San Diego, Fellowship Training, D13ZO-419

Total Study Cost: $109,325

Chronic wasting disease (CWD) is a fatal prion disorder of deer, elk, and moose that spreads rapidly through wild cervid populations. It is not clear whether other wildlife species are also at risk for CWD infection. This fellow is seeking to better understand the molecular mechanisms that determine whether a species is susceptible to CWD, which would help with surveillance efforts geared to high-risk species.

Investigating a Potential Vaccine for Pneumonia in Bighorn Sheep

Dr. Abirami Kugadas, Washington State University, Fellowship Training, D13ZO-418

Total Study Cost: $109,868

Domestic sheep and bighorn sheep carry pneumonia-causing bacteria; however, domestic sheep carry a strain that is fatal in bighorn sheep. Presently, no measures are available to prevent the transmission of this bacterial strain among species of sheep. This fellow is investigating a potential vaccine for domestic sheep that would reduce the transfer of harmful bacteria to bighorn sheep.

Understanding the Spread of Pneumonia Within Bighorn Sheep Populations

Dr. Raina K. Plowright, Pennsylvania State University, D13ZO-081

Total Study Cost: $214,770

This research identifies risk factors for sheep that become carriers of pneumonia and develops protocols for identifying carriers. The investigators will outline strategies to reduce mortality and morbidity associated with pneumonia in bighorn sheep and will propose alternative methods for managing affected populations.
In addition to study sponsorships, Morris Animal Foundation also offers sponsorships for its veterinary student scholars. The Veterinary Student Scholars Program gives veterinary students hands-on exposure to veterinary medical research in hopes that some will consider a career in research, a field where they are so critically needed.

Through this program, Morris Animal Foundation awards stipends up to $4,000 to veterinary students who wish to participate in clinical or basic animal health and/or welfare research. Students must devote a minimum of 50 percent of their time to the project for the equivalent of a 10- to 12-week period. Students are selected by their institution based on their academic standing, endorsement from a responsible mentor and a proposed research project consistent with the Foundation’s guidelines.

This type of sponsorship allows you to help further the career of a talented student. You can choose by study topic, species or university.

If you are interested in sponsoring a student project, please contact a development officer at 800.243.2345 or sponsorship@MorrisAnimalFoundation.org for availability.
Special thanks to Ray Cassel for designing this piece.
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