



# 2011-2012

The Future Is in  
Your Hands

VETERINARY STUDENT SCHOLARS SPONSORSHIP OPPORTUNITIES



### Help create a healthier tomorrow for animals

Future animal health advancements can only happen with the help of dedicated, passionate veterinary scientists. Through the Veterinary Student Scholars Program, Morris Animal Foundation inspires passionate veterinary students to pursue a career in animal health and welfare research—and helps to ensure that there will be a next generation of scientists to advance veterinary medicine.

The program has grown from an initial class of 24 veterinary students in 2005 to 80 in 2011. Students from almost every U.S. veterinary school and from veterinary schools in 13 other countries applied this year. Morris Animal Foundation received 141 applications for the 2011 grant program, twice as many as the previous year, and we are able to fund about half.

### Your sponsorship allows us to help students launch their careers in animal health

Through the Veterinary Student Scholars Program, students design their projects and work closely with established mentors in a hands-on learning environment. They also present a project to the Foundation's scientific advisers and trustees at our health-study review meetings, where they compete for cash awards of \$2,500, \$1,500 and \$1,000 in the categories of small animal, large animal and wildlife.

By sponsoring a Veterinary Student Scholars Program project, you help ensure that the next generation of scientists will be there to make a difference in the lives, and health, of future animals. Become a Veterinary Student Scholars Program sponsor today and help aspiring students pursue their goal of helping animals enjoy healthier lives.

To sponsor a student scholar, contact Allen Byrne, special programs and communications coordinator, at [abyrne@MorrisAnimalFoundation.org](mailto:abyrne@MorrisAnimalFoundation.org) or 800.243.2345.











# Scholars

## Help students advance animal health

Morris Animal Foundation is committed to training future scientists whose work will lead to advanced diagnostics, preventions and treatments for diseases affecting animals. Since its inception in 2005, the Veterinary Student Scholars Program has given more than 300 grants to students from more than 60 different colleges and universities in 16 countries.

With support from the Foundation and dedicated study sponsors, students last year:

-  Evaluated the proper dosages of immunosuppressant drugs in treating inflammatory diseases in dogs
-  Provided a foundation for the development of new chemotherapeutic strategies to treat non-Hodgkin's lymphoma in dogs
-  Helped sequence viral genes from feline coronavirus-positive cats and determined mutations that may provide insight into the development of feline infectious peritonitis
-  Developed a test to detect changes in red blood cells of cats with anemia
-  Examined the effects of a diabetes medication on adult and neonatal alpacas and llamas and determined how the effects may differ by age
-  Evaluated a novel approach to detecting "milkshakes," which are illegal substances given to horses before races to make them run faster and farther
-  Analyzed the prevalence of leptospirosis in primates and other animals living in zoos in Colombia
-  Tested for the presence of tick-borne pathogens in Grant's gazelles

Learn more about animal health successes like these at [www.MorrisAnimalFoundation.org](http://www.MorrisAnimalFoundation.org).



# Helping Students Help Cats

## BLOOD DISORDERS

### Evaluating a Blood Transfusion Technique

Brandon Heikes, Oregon State University, D12FE-612

Project Cost: \$3,500

Cats often need red blood cell (RBC) transfusions as part of treatment for a variety of health issues, including trauma, anemia due to kidney failure and anemia due to RBC parasites. A common technique for giving cats transfusions involves a syringe and an RBC filter. Previous research has shown that when this method is used in dogs, it leads to rapid loss of the transfused cells from circulation, which reduces the effectiveness. Feline RBCs differ in flexibility and resistance to trauma compared with canine RBCs, and it is not known how well this method works for RBC transfusions in cats. The student scholar will help measure the loss of RBCs following transfusion using a cat's own RBCs. He will then assess the short-term and long-term survival of the transfused cells. Data from this study will improve the understanding of RBC transfusions in cats and aid in better treatment.

## GENETICS

### Understanding the Genetic Link to Catnip Response in Cats

Natalie Villani, University of California–Davis, D12FE-601

Project Cost: \$5,500

A variety of feline species exhibit a recognizable, repeatable behavioral response to catnip, but not all domestic cats respond in the same way. Previous work has indicated that the tendency to respond to catnip is an inherited trait, but this research predates the genetic and genomic tools now available. The student scholar will use new genome-wide technology to look for genes that may be linked to catnip response. Finding genetic factors contributing to this unique response could provide insight into how cats process odors and what pathways are involved in the resultant behaviors. This information could be used to improve the welfare of cats housed in group situations such as shelters.

“ The Morris Animal Foundation Veterinary Student Scholars Program provided me with an outstanding opportunity to gain experience in clinical research and to work with experts in my field of interest. ”

— Claire Fellman, Mississippi State University

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## HEART/CARDIOVASCULAR

### Evaluating a New Device for Measuring Feline Blood Pressure

Erika Fauth, Louisiana State University, D12FE-607

Project Cost: \$5,500

Measuring blood pressure is an important part of monitoring anesthetized patients and evaluating critically ill animals and their response to treatment. In dogs, blood pressure is routinely measured by indirect methods, including the Doppler detector, in which a pressure gauge is read, and the use of automated oscillometric devices. Studies involving the use of oscillometric units in cats have been largely inconclusive, but new oscillometric devices claim to be specifically optimized for use in cats. This study will compare indirectly obtained blood pressure values produced by a newly designed oscillometric device with directly measured blood pressure values. Having an effective automated oscillometric device would significantly improve veterinarians' ability to monitor feline patients.

## HEART/CARDIOVASCULAR

### Evaluating a Noninvasive Technology for Monitoring Critically Ill Cats

Erik Zager, Cornell University, D12FE-602

Project Cost: \$5,500

In critically ill cats, the underlying disease process often leads to a decreased supply of oxygen and other nutrients to vital organs. The current technique for determining whether organs are receiving enough oxygen requires placement of a catheter into a large vein in the center of the cat's body. A new, noninvasive technology that shines an infrared light through the skin is being used in critically ill humans to measure the amount of oxygen in muscle tissue. The student will evaluate whether this technology is capable of monitoring critically ill cats. If successful, this new technology would significantly improve the ability of veterinarians to treat these difficult-to-monitor patients and will likely result in better outcomes for these feline patients.

“Your contribution to my development as a young professional and to the acquisition of new medical knowledge about mast cell tumors will not go unrecognized. This research project truly means a lot to me.”

— Bonnie Harrington, Ohio State University

### Create a Healthier Tomorrow

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### INFECTIOUS DISEASES

#### Educating New Pet Owners About Follow-up Care for Ear Mites

Emily Houge, Iowa State University, D12FE-616

Project Cost: \$5,500

Ear-mite infections are caused by tiny parasites that irritate and inflame the ear tissue. Ear mites pass from animal to animal by physical contact and are highly contagious. In animal shelters, cats who have ear mites are treated; however, they usually require another treatment after adoption. Unfortunately, many cats don't receive the second treatment after adoption, so the infection recurs. The student will research which ear-mite treatment is most effective and work to educate adopters about the infection and the necessity to finish the treatment. After developing an educational pamphlet and providing it to new owners, the student will measure the success of the educational outreach.

### INFECTIOUS DISEASES

#### Evaluating a New Diagnostic Tool for *Mycoplasma* Infections

Uri Donnett, Iowa State University, D12FE-610

Project Cost: \$5,500

*Mycoplasma* species are a group of bacteria that cause infection in animals, particularly cats. *Mycoplasma felis* is part of the normal flora of the eye and upper respiratory tract of cats, but recent clinical data indicate that *M. felis* is linked to feline conjunctivitis and respiratory illnesses that occur in up to 49 percent of diseased cats. Rapid diagnosis of the specific infectious agent is necessary for treatment, pain management and control of disease spread, but current diagnostic tests aren't fast or effective. The student scholar's mentors have developed a diagnostic test that detects unique genomic signatures of *Mycoplasma* species in other animals. The student will help validate the use of this test for diagnosing *Mycoplasma*-associated disease in cats. Results will help reduce or prevent the pain and suffering associated with infectious *Mycoplasma* diseases in cats.





## INFECTIOUS DISEASES

### Analyzing a New Way to Diagnose Kidney Infections in Cats

Lauren Habenicht, Colorado State University, D12FE-603

Project Cost: \$3,500

Kidney infections in cats can cause permanent kidney damage and may even lead to death if left untreated. Diagnosis is based on clinical signs and a positive urine culture, but in some cases, urine cultures produce false-negative results or ultrasound imaging is inconclusive. In humans, urinary cytokines (small proteins released in response to inflammation) are associated with kidney infection in children, and changes in cytokine levels can indicate infection severity. Little has been done to investigate this technique in animals. The student scholar will help determine whether urinary cytokines may be used to diagnose kidney infection in cats. The findings could help researchers develop a noninvasive test that would provide more accurate diagnosis and treatment of cats with kidney and urinary tract infections.

## METABOLIC DISORDERS

### Determining a Genetic Basis for Diabetes Insipidus in Cats

Jessica Wofford, North Carolina State University, D12FE-604

Project Cost: \$5,500

Diabetes insipidus is a common feline disease that occurs when the body doesn't release enough antidiuretic hormone (ADH) or when the kidneys' sensitivity to the hormone decreases. ADH regulates water retention and is released when the body is dehydrated. When less ADH is released, the cat drinks and urinates excessively to compensate. In humans, various genetic mutations appear to be linked to excessive thirst and urination, and treatment with synthetic ADH can reverse the problem. The student and her mentor hypothesize that the mutation of a single gene, which encodes ADH, causes central diabetes insipidus. They will compare the genetic coding sequences of two cats diagnosed with diabetes insipidus and successfully treated with synthetic ADH with the coding sequence of unaffected cats to identify whether a genetic mutation may be responsible for disease development.



## OVERPOPULATION

### Analyzing a Method to Control Feline Fertility

Mercedes Soriano, National University of La Plata, Argentina, D12FE-608

Project Cost: \$3,500

Cat overpopulation is a severe social and sanitary problem in many countries, and there is great need for safe, efficient and practical drugs for preventing reproduction. In other species, gonadotropin-releasing hormone (GnRH) agonists have proven to be effective at controlling fertility when given before pubescence. The student will study the efficacy and clinical safety of prepubertal administration of a GnRH agonist in cats. The researchers hypothesize that in cats, as in other species, GnRH agonists administered at a critical prepubertal period will postpone puberty and cause postpubertal infertility. The student will have hands-on experience with the cats and will help record and analyze data. The findings may contribute to feline population control worldwide. All of the cats will be spayed at the end of the study and offered for adoption.

## PAIN MANAGEMENT

### Determining a Better Technique for Managing Pain in Cats

Amanda Hedges, University of California–Davis, D12FE-613

Project Cost: \$5,500

Managing pain in cats can be challenging, in part because cats do not tolerate nonsteroidal anti-inflammatory drugs (NSAIDs) well. Opioids are only effective when given via injection, which isn't practical for most cat owners. Oral transmucosal absorption, in which a drug is absorbed into the mouth but not swallowed, could be a more effective method, and one that is easier for owners to administer. The student scholar will look at the pharmacokinetics of small doses of the analgesic buprenorphine, after it is delivered intravenously and via oral transmucosal administration, to determine how long the drug stays in the cat's plasma for each type of administration. The information gathered from this study could help scientists develop a better technique for managing pain in cats.

“ Because of your generosity, I was able to determine the cause of the respiratory disease outbreak that had been plaguing the Oklahoma City Animal Shelter for two years. There is no telling how many animals have been saved because of your support. ”

— Heather Wallace, Oklahoma State University

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## STRESS/WELFARE

### Identifying Reasons for Sudden Death of Kittens in Shelters

Allison Rowland, Western University of Health Sciences, D12FE-614

Project Cost: \$5,500

Animal shelters face many medical challenges because animals are exposed to numerous diseases and infections from incoming animals. Kittens are particularly vulnerable, and many shelters report sudden death in kittens aged 4 to 5 weeks. At this age, they are nearly ready for adoption, and kittens are often more readily adopted than adult animals available at the same facility. The affected kittens show acute severe systemic disease, and in more than 50 percent of these cases, the end result is natural death or humane euthanasia. The student will review the individual medical records of these kittens and try to identify stressful clinical conditions that could help explain the circumstances that led to their deaths.

## STRESS/WELFARE

### Evaluating Behavioral Effects of Declawing and Tendonectomy

Laura Olsen, University of Minnesota, D12FE-609

Project Cost: \$5,500

Many cat owners elect to have claw-altering surgery performed on their cats. There is speculation that these controversial procedures cause long-term pain and behavioral problems; however, there is little scientific evidence to support this claim. The student scholar will assist with a survey that asks cat owners a series of questions about their cat's lifestyle, behaviors and other parameters in order to look for associations between various behaviors and declawed status. The purpose of this study is to add current information to the body of literature that is available on long-term behavioral implications of claw-altering surgeries. Since 2001 there have been no similar studies, so this study aims to reflect advances in surgical technique, pain control and owner awareness of feline behavior. Results of this study will enhance understanding of the effects of claw-altering surgeries on feline welfare.

“ Thank you so much for your sponsorship. Since working at a veterinary hospital, I have noticed that animal-human interaction is a crucial element of veterinary medicine. You have given me the opportunity to study one aspect of this interaction. ”

— Traci Bond, Texas A&M University

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### **BONE/MUSCULOSKELETAL**

#### **Treating Canine Joint Disease with Stem Cell Therapy**

Maria Afonso, Abel Salazar Institute for Biomedical Sciences, University of Oporto, Portugal, D12CA-635

Project Cost: \$5,500

Degenerative and inflammatory joint diseases seriously affect an animal's quality of life. Stem cell therapy offers great potential for treating a growing variety of joint inflammatory and degenerative diseases in dogs. Understanding the basic biology of stem cells will be fundamentally important for veterinary surgeons and clinicians. The student and her mentor will work to develop an improved veterinary medicine therapy for the regeneration of joints in dogs suffering from these diseases. They will treat dogs suffering from joint disease with one of two types of stem cells and will then evaluate improvements in the dogs' clinical signs. The data will help determine the best approach to treating joint disease with stem cells.

### **BONE/MUSCULOSKELETAL**

#### **Designing a Replica Femur for Testing Treatments**

Brett Gulledge, North Carolina State University, D12CA-631

Project Cost: \$5,500

Currently, most orthopedic research relies on the use of cadaver bones, but there are a number of drawbacks to using cadaver bones to evaluate the efficacy of treatments. Cadaver bones have highly variable shapes and sizes, may have come from dogs with orthopedic disease and are prone to dehydration and degradation. Thus, there is a need for a validated canine femur replica to test orthopedic treatments. Using a technique similar to that used in human orthopedic research, the student will work to develop replicas of a canine femur (thigh bone) that are suitable alternatives to actual bone and can be used to test novel orthopedic implants and surgical procedures. If the student and his mentor are successful in validating this design, it may become a standard for testing new femoral implant designs. It will also enable surgeons to practice complex orthopedic procedures before operating on a patient, allowing them to identify potential complications and make alterations that would reduce the risk of surgical failure.





## BONE/MUSCULOSKELETAL

### Improving Accuracy of Orthopedic Treatment

Alexander Robb, Tufts University, D12CA-630

Project Cost: \$5,500

Medial patellar luxation (MPL), a condition in which the kneecap dislocates or moves abnormally, is one of the most common orthopedic problems of the canine stifle. Recent studies have shown that traditional methods for diagnosis and treatment of MPL may be inaccurate, and there is a high rate of recurrence after surgery. Novel surgical strategies have focused on correcting femoral malformation using distal femoral osteotomy (DFO) surgery. Because DFO is complicated and expensive, it is imperative to establish an accurate and repeatable method for measuring femoral deformity so that DFO is performed accurately and only when necessary. The student will evaluate the utility and accuracy of femoral deformity measurements using radiographic and computed tomographic imaging in clinically abnormal dogs. This information will lead to a better standard of care for canine patients, prevent unnecessary surgeries and increase clinician and client confidence that, when necessary, the investment in surgery will successfully fix the problem.

## BONE/MUSCULOSKELETAL

### Enhancing Stem Cell Therapy for Treating Injuries

Dorothy Jones, Virginia Tech, D12CA-620

Project Cost: \$5,500

Veterinarians have been using stem cell therapy to treat equine and small-animal patients for more than 10 years. Thus far, it has most often been used to treat orthopedic injuries (including osteoarthritis), tendon injuries and ligament injuries. Although stem cell therapy is becoming common practice, current therapies do not create tissue equivalent in strength and flexibility to the original, pristine tissue. Increased quality and decreased cost of stem cell therapy would improve the quality of life for many animals that are battling the pain and lameness associated with musculoskeletal conditions. With that goal in mind, this project will investigate the differences in proliferation, differentiation and interaction of mesenchymal stem cells in various physical environments. The aim is to improve stem cell therapy for tendon and ligament injuries in dogs through increased understanding of the effect of the physical microenvironment. The researchers will then apply this knowledge to improve cell culture quality and quantity.



### BONE/MUSCULOSKELETAL

#### Identifying a Genetic Mutation Associated with Achilles Tendon Ruptures

Sara Losinski, University of Minnesota, D12CA-607

Project Cost: \$4,000

The use of fluoroquinolones, a category of broad-spectrum antibiotics, in human medicine has been associated with tendon inflammation and Achilles tendon rupture, both of which are extremely painful. Susceptibility to ruptures may be linked to genetic mutations. Because fluoroquinolone use triples a person's risk of Achilles tendon rupture, these antibiotics are strictly avoided when treating athletes. Achilles tendon ruptures also occur in dogs, and hunting dogs in particular have a high incidence. Using information from human research, the student scholar will try to determine whether there is a canine genetic mutation associated with fluoroquinolone-induced Achilles tendon ruptures. Results from this study may support a change of treatment for dogs prone to this type of injury, including setters, retrievers and other hunting breeds.

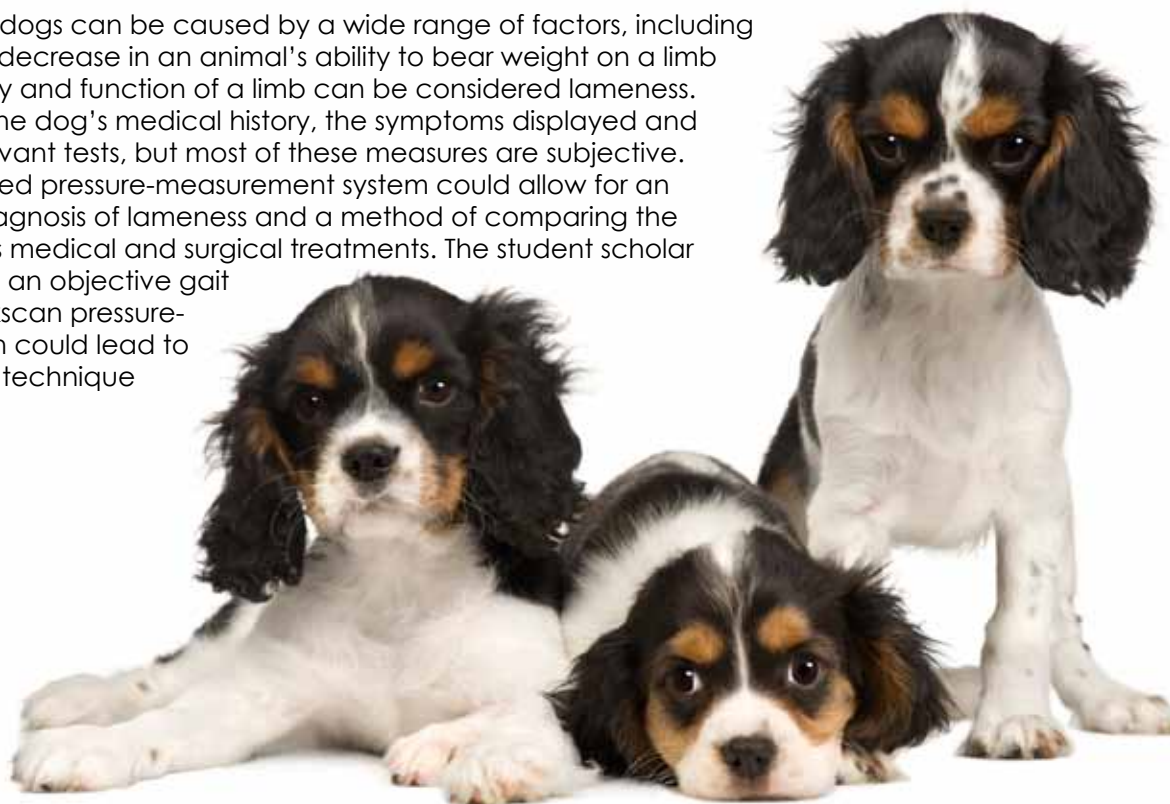
### BONE/MUSCULOSKELETAL

#### Evaluating a Potential Objective Test for Diagnosing Lameness in Dogs

Jonathan Cortez, Western University of Health Sciences, D12CA-606

Project Cost: \$5,500

Lameness or limping in dogs can be caused by a wide range of factors, including injury and arthritis. Any decrease in an animal's ability to bear weight on a limb or in the normal mobility and function of a limb can be considered lameness. Diagnosis is based on the dog's medical history, the symptoms displayed and the results of a few relevant tests, but most of these measures are subjective. The use of a standardized pressure-measurement system could allow for an objective and rapid diagnosis of lameness and a method of comparing the effectiveness of various medical and surgical treatments. The student scholar will work to standardize an objective gait analysis test using a Tekscan pressure-mapping system, which could lead to a improved diagnostic technique for lameness.





## CANCER

### Identifying Protein Markers Linked to Brain Tumors

Sami Al-Nadaf, University of Georgia, D12CA-639

Project Cost: \$5,500

Meningiomas are frequently found in the central nervous system of humans and dogs. These tumors are often benign and can be treated by surgical removal, but the recurrence rate is high in dogs. Research groups studying human brain tumors have identified several inflammatory proteins that are linked to recurrence in humans. In addition, the expression of certain proteins has been used to decrease the growth of meningioma cells in a laboratory setting. The student will explore whether canine brain tumors express similar proteins and whether that expression varies based on the grade of the tumor. This knowledge will allow further research on how to use these inflammatory markers therapeutically in an attempt to stop replication and destroy the tumor cells.

## CANCER

### Evaluating Potential Negative Effects of a Cancer Drug

Steve Patten, University of Guelph, Canada, D12CA-624

Project Cost: \$5,500

As a volunteer and summer student at the Ontario Veterinary College, the student scholar, along with his mentor, discovered that canine osteosarcoma patients treated with radiation therapy and pamidronate, a drug commonly used to treat bone cancer, did statistically worse than patients who received radiation therapy alone. Few studies have looked at the benefits or lack of benefits of giving pamidronate to dogs with osteosarcoma. This study will further characterize this negative association by evaluating the interaction of osteosarcoma cell lines in vitro when they are treated with combinations of pamidronate and radiation. The researchers hope this study will help them gain a better understanding of possible outcomes with this combination of treatments.

“ As a researcher I want to say thank you. I firmly believe that these research programs are the best way to interest a new generation of students with a veterinary perspective in necessary and cutting-edge research that benefits animals and humans alike; the only way to do that is through the generous support of foundations like Morris Animal Foundation. ”

— Erin McQuinn, Colorado State University

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### CANCER

#### Identifying the Best Method for Determining Prognosis in Mast Cell Cancer Cases

Keiko Petrosky, Tufts University, D12CA-616

Project Cost: \$5,500

In dogs, mast cell tumors are one of the most common cancers, composing up to 21 percent of all canine skin cancers. Clinical signs of cutaneous mast cell tumors can vary from easily cured isolated tumors to fatal metastases. Failure to accurately predict the outcome can result in patients being subjected to painful, expensive and unnecessary treatments or conversely can result in their not getting the intensive treatment they need. The student scholar will evaluate different grading systems to determine which method will provide the most accurate prognosis for canine patients diagnosed with cutaneous mast cell tumors. More accurate grading systems will better predict outcomes and will help owners and practitioners determine the treatment options that will work best for the patient.

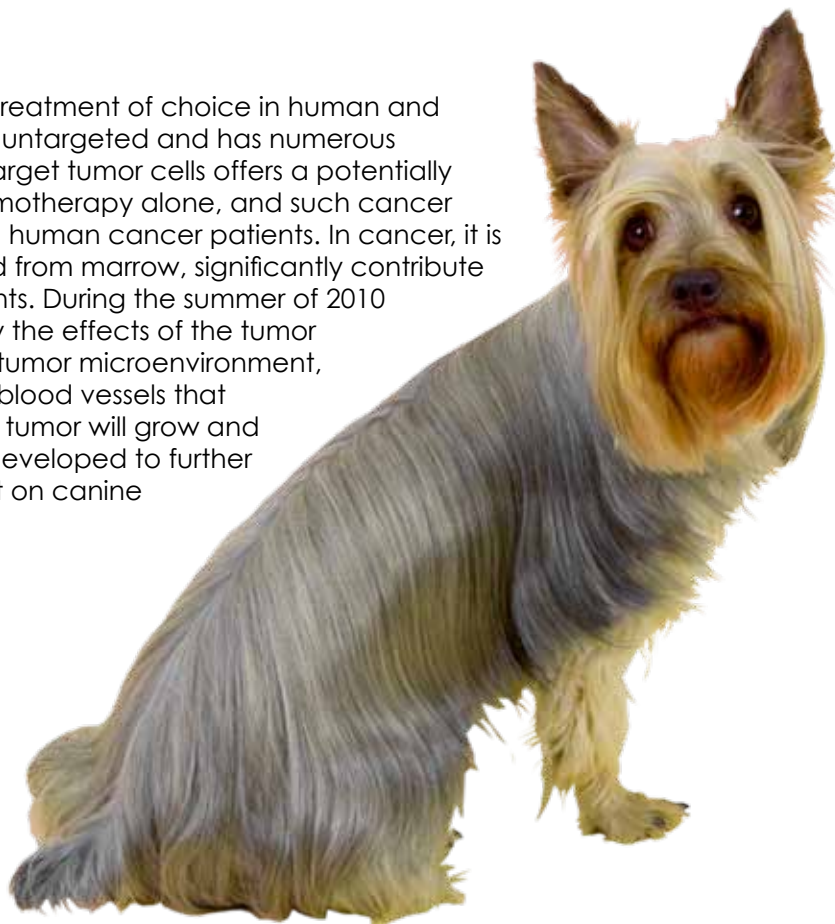
### CANCER

#### Understanding the Cells That Affect Tumor Development

Jacob Wasserman, Ohio State University, D12CA-615

Project Cost: \$5,500

Although chemotherapy has been the primary treatment of choice in human and veterinary oncology, chemotherapy is relatively untargeted and has numerous side effects. Stimulating the immune system to target tumor cells offers a potentially more effective and less toxic alternative to chemotherapy alone, and such cancer immunotherapy is being explored in canine and human cancer patients. In cancer, it is thought that myeloid cells, a type of cell derived from marrow, significantly contribute to the immunosuppression seen in cancer patients. During the summer of 2010 the student scholar developed a model to study the effects of the tumor microenvironment on canine myeloid cells. The tumor microenvironment, which includes the normal cells, molecules and blood vessels that surround and feed a tumor cell, affects how the tumor will grow and spread. The student will now use the model he developed to further study the effects of the tumor microenvironment on canine myeloid cells.





## CANCER

### Identifying Better Methods for Determining Prognosis of Dogs with Bone Cancer

Carmen Chui, University of Guelph, Canada, D12CA-603

Project Cost: \$3,500

Osteosarcoma is the most common bone tumor in dogs, and it often spreads to other parts of the body, including the lungs and other bones. Treatment usually requires surgical removal of the tumor and chemotherapy to halt the cancer's spread. However, it's difficult to predict the success of the chemotherapy because the extent of the cancer's spread isn't usually apparent at diagnosis. The student will measure the expression of a particular gene that is known to correlate with a good response to chemotherapy in human patients. If this gene contributes to a better responsiveness to chemotherapy in dogs, measuring it should provide a more accurate prognosis for canine patients before they undergo amputation and chemotherapy. This will allow owners and veterinarians to make more informed treatment decisions. This work will also form the basis for future therapies aimed at enhancing patient response to chemotherapy.

## CANCER

### Determining the Best Way to Collect Urine in Dogs with Bladder Cancer

Benjamin Olson, Purdue University, D12CA-602

Project Cost: \$5,500

Animals with transitional cell carcinoma of the bladder often have bacteria in their urine. This makes urine collection using a sterile hypodermic needle risky because it could spread the cancer cells. Because of this, a free-catch method is typically used, but this method can result in contamination by normal bacteria from the lower urinary tract or the skin. Contamination can lead to false-positive urine cultures and unnecessary antibiotic treatment, which can lead to multidrug resistance. The student will compare the two methods of urine collection to determine whether the free-catch method provides an accurate representation of bacteria within the urinary bladder. He will also test a cleaning protocol that may decrease bacterial contamination. The student hopes to determine how best to collect urine from dogs with bladder cancer.



### DENTAL

#### Determining Prevalence of Dental Disease in Dogs

Alyssa Ziche, University of Minnesota, D12CA-628

Project Cost: \$5,500

Poor oral health has been shown to be linked to other health problems in animals. Veterinarians believe 80 to 85 percent of dogs have some stage of periodontal disease. However, there are no reliable prevalence data to suggest that such prevalence exists. Previous studies have been done to estimate the number of dogs with periodontal disease, but a biased or small number of patients was used, thus resulting in scientifically unreliable information. The objective of this study is to obtain such information by determining the prevalence of periodontal disease, fractured teeth and oral pathology in a random population of 1,000 canine patients.

### HEART/CARDIOVASCULAR

#### Analyzing the Effectiveness of Pacemakers in Dogs

Joseph Thiels, Louisiana State University, D12CA-637

Project Cost: \$5,500

Pacemakers are small devices that are placed in the heart of patients with cardiac disease. Manufacturers usually donate pacemakers developed for human adults for implantation in dogs, but this poses some concerns. Rate-responsive pacemakers are equipped with motion-activated sensors that determine what the heart rate should be from moment to moment, but these sensors were designed for people, and their effectiveness in dogs is not known. If rate-responsive sensors aren't accurate, the pacemaker may keep the dog's heart rate too slow or too fast, preventing the animal from returning to a normal activity level. In addition to comparing the normal heart-rate variation of healthy animals with data collected by pacemakers implanted in canine patients, the study will compare and evaluate the effects of the optimized pacing protocol to the manufacturer default settings. The information may help veterinary cardiologists modify pacemaker settings to more appropriately reflect physiologic heart-rate variations, thus increasing the quality and longevity of the dog's life.

“ Thanks to your generosity, I was able to spend the summer at the Smithsonian's National Zoological Park in the Center for Evolutionary and Conservation Genetics Laboratory. ”

— Penny Spiering, Smithsonian Institution

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## HEART/CARDIOVASCULAR

### Gathering New Information on Chronic Mitral Valve Disease

Alexis Livaccari, Louisiana State University, D12CA-636

Project Cost: \$5,500

Chronic mitral valve disease is the most common cardiac disease in dogs. In healthy dogs, the heart functions as a pump that circulates blood within the body, thereby supplying oxygen and nutrients to the tissue. Heart failure results in a decrease in the amount of blood circulating, which subsequently triggers dysfunction of other organs, especially the kidneys. The goal of this study is to determine whether ultrasonography, a noninvasive tool, can help identify a decrease in kidney function as a result of cardiac disease in dogs. The student will help conduct ultrasound exams and analyze the results. The data will contribute to the understanding of chronic mitral valve disease and help open the doors for new treatment.

## INFECTIOUS DISEASES

### Studying the Potential for Cefovecin to Lead to Increased Bacterial Resistance

Megan Lawrence, Kansas State University, D12CA-612

Project Cost: \$3,500

Cefovecin (brand name Convenia) is long-acting injectable antimicrobial agent that is labeled to treat skin infections in companion animals. It is also effective for treating urinary tract infections (UTIs) in dogs, a clinical problem affecting one in seven dogs at some point during their life. Skin infections and UTIs can recur after initial treatment, often with antimicrobial-resistant bacteria, but a primary reason for treatment failure is a lack of owner compliance with treatment regimens. Cefovecin is considered a convenient antimicrobial choice because a single subcutaneous injection, given by the veterinarian, remains effective for up to 14 days. Although minimal adverse effects have been documented with cefovecin use in dogs, no studies have been performed to determine the effect of this antimicrobial on the gastrointestinal microflora. Studies in humans and cattle have shown that treatment with a drug like cefovecin can increase the number of resistant gastrointestinal bacteria in the feces of these species. If similar effects are seen in dogs treated with cefovecin, resistant bacteria could be shed in feces and contribute to the challenging problem of recurrent UTIs in dogs. The student scholar will evaluate the effect of cefovecin on the fecal flora of healthy dogs in an effort to learn more about lessening the recurrence of UTIs.

### INFECTIOUS DISEASES

#### Determining Risk Factors for Fungal Infection

Melissa Munks, University of Illinois, D12CA-605

Project Cost: \$5,500

Blastomycosis is an infection found in dogs, people and occasionally cats. It is caused by the fungal organism *Blastomyces dermatitidis*, which grows in sandy, acidic soil near river valleys and other waterways. Certain populations of dogs are at greater risk for infection, including hunting and sporting breeds that are exposed to soil in wet areas and young adult dogs that are more likely to be used in hunting or field trials. The student scholar will analyze data collected from medical records of dogs diagnosed with blastomycosis between 1992 and 2007. She will evaluate how factors such as breed, age, weight, use of antifungal and anti-inflammatory drugs, length of therapy and presenting clinical signs affect the short- and long-term outcomes of the disease. Determining which factors affect disease progression and survival will help owners and veterinarians make informed treatment decisions.

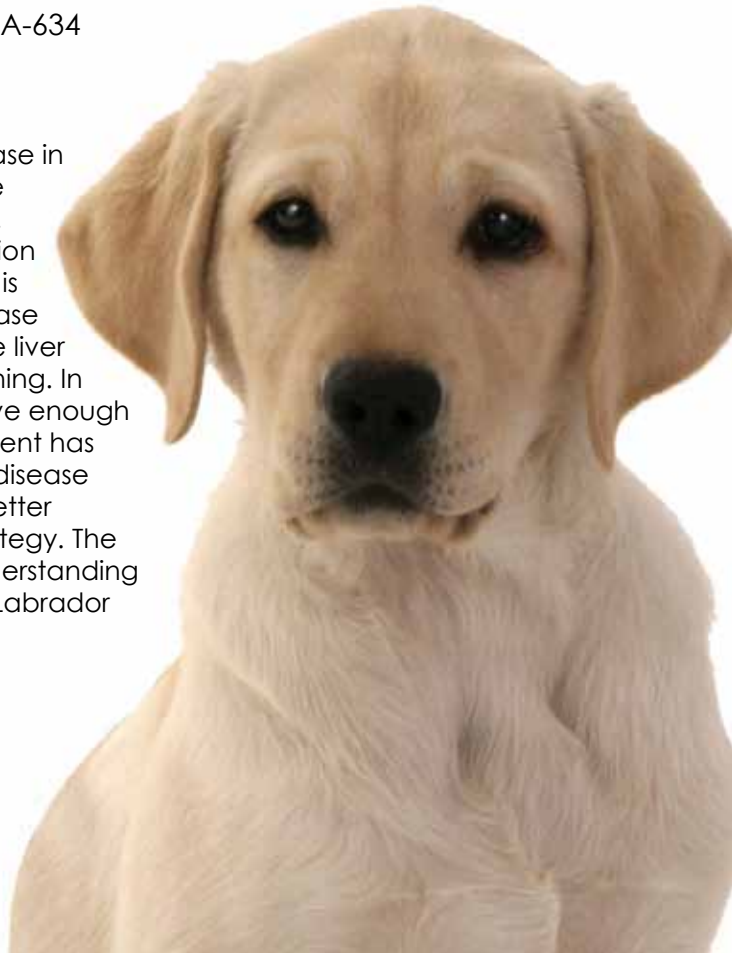
### METABOLIC DISORDERS

#### Gathering Information to Better Diagnose Deadly Liver Disease in Dogs

Karen Dirksen, Utrecht University, Netherlands, D12CA-634

Project Cost: \$3,500

Copper-associated chronic hepatitis is a hereditary disease in which copper accumulates in the liver, causing oxidative stress and leading to inflammation and fibrosis formation. Clinical signs usually develop late in the disease progression as liver function becomes more impaired, so the disease is likely underdiagnosed. Left untreated, however, the disease can be fatal. Diagnosis can be made only by an invasive liver biopsy procedure, which requires advanced clinical training. In addition, current blood and urine markers are not sensitive enough to diagnose the disease in the early stages, when treatment has the best outcome. The student scholar will evaluate the disease process to help identify information that could lead to better diagnostic methods and a more effective treatment strategy. The data gathered will make a major contribution to the understanding of the pathophysiological background of this disease in Labrador Retrievers and other affected dog breeds.





## METABOLIC DISORDERS

### Studying the Prevalence of Growths in Endocrine Organs

Rachel L'Heureux, Oklahoma State University, D12CA-629

Project Cost: \$3,500

Endocrine organs, such as the pituitary gland, adrenal glands and thyroid glands, are responsible for many functions within the body, including regulating body temperature and maintaining body weight. The endocrine system can experience abnormal growth, as it does with cancer, which in turn can lead to disruptions of basic bodily functions. Not all growths lead to metabolic dysfunction, however. Currently, there is little information on the prevalence of growths within endocrine organs of dogs and how this translates to clinical disease. The student will study and characterize abnormalities in the endocrine organs of 100 dogs received for postmortem examination. This information will be compared to data from clinical histories and other indicators of clinical endocrine disease to determine how many dogs have growths within endocrine organs yet lack outward signs of disease. This study will also develop a large database of archived tissue samples with detailed clinical information for future study.

## NUTRITION

### Examining the Effects of Fatty Acids on Sense of Smell in Dogs

Jacquelyn Faulkner, Oklahoma State University, D12CA-643

Project Cost: \$5,500

Dogs that use olfactory sensitivity, such as search-and-rescue dogs, rely on their ability to discriminate one scent from other scents in a search area. Proper nutrition is important to maintaining physical health, including vision and possibly a dog's sense of smell. This project looks at the effects of omega-3 fatty acid supplements on the olfactory abilities of working dogs. Dogs will be tested as to how much of the fatty acid is in their system and then will be given an olfactory learning set and memory task to perform. Results from this study could help improve scenting abilities in these dogs, which would help them to more quickly perform olfactory tasks, such as rescuing someone trapped after a natural disaster. Decreasing the time it takes to perform these tasks will also benefit the dog because it would decrease fatigue and the risk of injury.

“ I appreciate the opportunity you have provided for me to be involved in a project with such important implications. My experiences have reinforced my choice to pursue a career in veterinary oncology. ”

— Joanne Tuohy, Colorado State University

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### OVERPOPULATION

#### Creating Tools That Reduce Animal Returns at Shelters

Rochelle Prudic, Western University of Health Sciences, D12CA-619

Project Cost: \$4,500

Each year, an estimated 7 million pets are placed in shelters, and 4 million of them are euthanized before adoption. Twenty percent of surrendered dogs in shelters had been previously adopted from a shelter. These return statistics are largely attributed to the owner's inability to address the pet's behavioral, financial or physical needs. The A.D.O.P.T. (Animals Dependent on People Training) initiative creates veterinary-approved, first-time-owner training that will serve to reduce the number of animals returned to shelters. The A.D.O.P.T. curriculum is based on information collected from top veterinarians and veterinary organizations in their specialized fields of toxicology, behavior, emergency, welfare and wellness. The student will conduct and document the training program for adoption counselors and first-time owners to monitor its success in reducing animal returns. This in turn will help measure the success of the A.D.O.P.T. initiative in an animal adoption center. The long-term goal will be to create a veterinary-developed program with national distribution that will educate animal rescue personnel and new owners about basic canine medical, behavioral and financial planning needs at the time of adoption.

### PAIN MANAGEMENT

#### Assessing New Methods of Pain Control During Knee Surgery in Dogs

Sara Jablonski, Colorado State University, D12CA-621

Project Cost: \$4,000

Dog owners in the United States spend an estimated \$1.32 billion annually for the treatment of ruptured cranial cruciate ligaments. Although a significant amount of research has gone into developing different surgical techniques to treat this condition, far less time has been devoted to discovering the best practices for pain management during surgical repair. Preliminary data indicate that dogs receiving local anesthesia through the use of specialized local nerve blocks have less pain during surgery, better surgical recoveries and require less systemic pain medications than dogs receiving only systemic pain control or dogs receiving epidurals. The student will do a retrospective review to evaluate how well pain was controlled in three different populations of dogs that underwent surgical repair of cruciate ligaments and received different pain-control protocols. This study will contribute to practitioners' knowledge of pain-control techniques when treating this disease.





## STRESS/WELFARE

### Understanding the Needs of Neglected and Abused Dogs in Shelters

Lauren Larsen, Iowa State University, D12CA-638

Project Cost: \$3,500

Animal shelters use behavior assessments and modification programs to help determine pet adoptability and identify areas of concern that should be addressed to increase adoptability. Dogs who are in the shelter system because of animal cruelty or neglect represent a unique group of shelter dogs. The student and mentor hypothesize that because these dogs may have had suboptimal housing, negative interactions with humans and a lack of socialization, they will react differently than dogs relinquished to the shelter by their owners. The student will help survey Midwest animal shelters on their behavioral testing for dogs that have suffered cruelty and neglect and will evaluate how the dogs' stress-related behaviors and responses during human–animal interactions may differ from that of dogs relinquished by owners. Understanding the needs of these dogs will help determine appropriate management guidelines and practices that help them get adopted.

## STRESS/WELFARE

### Examining the Effects of Social Training on Adoption Rates

Alexandra Protopopova, University of Florida, D12CA-633

Project Cost: \$5,500

Millions of pet dogs are admitted to shelters each year, and about half are euthanized. Previous research has shown that obedience-trained dogs are 40 percent more likely to be adopted than untrained dogs and that sociability may play an even bigger role than obedience in ensuring adoption. Potential adopters perceive sociable dogs as being low in aggression and high in friendliness, intelligence and adoptability. The student hypothesizes that people prefer to adopt dogs that display social behaviors and that it may be beneficial to train shelter dogs to behave in a sociable manner. To test this hypothesis, dogs at a local shelter will be randomly assigned into a social training group, a noncontingent hand-feeding group or a control group. The student expects that more dogs in the social training group will be adopted than in the other groups. The results will have a direct effect on the welfare of shelter dogs by evaluating a novel training procedure that may increase adoption rates of healthy dogs, thereby decreasing the number of dogs housed and euthanized in shelters.

### CANCER

#### Optimizing PET-CT Imaging for Diagnosing Cancer

Cord Brundage, Colorado State University, D12MS-606

Project Cost: \$5,500

Positron emission tomography–computed tomography (PET-CT) imaging is the standard technology for diagnosing cancer in humans. The use of PET-CT imaging is just beginning in veterinary medicine, however, so there is much to be learned regarding optimal imaging protocols, normal tissue uptake and artifacts relevant to domestic animal species. This project involves a detailed evaluation of existing canine and feline PET-CT patient imaging files. Imaging protocols will be graded to identify which are optimal for each species, minimizing the likelihood of false-positives and imaging artifacts. This study will directly improve animal cancer PET-CT detection capabilities and will provide a more solid foundation for the future of veterinary PET-CT imaging.

### INFECTIOUS DISEASES

#### Testing a New Vaccine-delivery Device

Alyona Avdonina, Iowa State University, D12MS-607

Project Cost: \$5,500

Vaccination plays an integral role in maintaining animal health by inhibiting the spread of infectious disease through companion animal populations. However, current vaccination schedules are somewhat inefficient because they require regular rounds of immunization throughout an animal's life span. The time, cost and risk of complications associated with current vaccination practices may be alleviated by the development of an immune-responsive vaccine-delivery device. This study is seeking to develop an implantable vaccine-releasing device that automatically triggers inoculation based on the strength of an animal's immune response to the contained immunogen. The device responds to falling levels of antibodies by releasing vaccine, effectively re-immunizing the animal as necessary and ensuring consistent disease protection without the need for regularly timed immunizations. One-shot immunization would find most immediate application among high-risk groups, such as animal shelter populations and feral populations.





## INFECTIOUS DISEASES

### Determining Risk Factors for Methicillin-resistant *Staphylococcus aureus*

Aimee Vasse, Tufts University, D12MS-603

Project Cost: \$5,500

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a serious threat to humans, and it is becoming more frequent in pets, where it can cause severe infections in pets with compromised immune systems. MRSA is highly resistant to antibiotics, making treatment challenging. Previous research indicates that MRSA may be transmissible between pets and humans, and some studies have identified pets colonized with the organism in households that also include infected people. Companion animals used for therapy purposes in human hospitals are also noted to have a significant risk of MRSA colonization, as are those that have previously been given antibiotics. Although colonization does not represent infection, pets colonized with MRSA are more likely to develop clinical infection. This study seeks to identify risk factors for MRSA colonization in pets. The findings may help prevent exposure to MRSA at the household level and reduce colonization in pets.

## INFECTIOUS DISEASES

### Assessing the Cost-effectiveness of Anti-flea Medication Use in Animal Shelters

Crystal Sorensen, Iowa State University, D12MS-601

Project Cost: \$5,500

Shelter animals are at an especially high risk for contracting fleas because they are living in a transient environment. This is a major concern because fleas can cause many problems for the animals they infest, including allergic dermatitis, tapeworms and anemia, and they can also act as vectors for other diseases. Many shelters rely on sprays and flea baths as their only defense against fleas, but these products offer only short-term protection and don't control the flea population. Recently developed oral and systemic topical anti-flea medications, such as nitenpyram and fipronil, are fast acting, safe and effective. In this study, which will be conducted at several Midwest shelters, researchers will examine dogs and cats for fleas, will determine treatment and then will compare the average length of stay for healthy, adoptable animals at shelters that provide oral and systemic topical anti-flea medications with those that do not. The ultimate goal of this study is to determine whether new anti-flea medications are a cost-effective option for shelters.

“ I would like to express my gratitude to you for funding my veterinary student fellowship at the University of Pennsylvania, which gave me the ability to take part in such a rewarding research experience. ”

— Alexandra O'Keefe, University of Pennsylvania

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## IMMUNOLOGY

### Investigating a Protective Effect of Resveratrol During Inflammation in Horses

Lynn Brockway, University of Missouri, D12EQ-617

Project Cost: \$5,500

Horses with gastrointestinal disorders such as colic or colitis have an increased risk of also developing laminitis (also called founder). Risk of laminitis is increased when bacterial toxins move from the intestines into the bloodstream and cause a systemic inflammatory response known as endotoxemia. More effective preventive and treatment strategies are needed to minimize endotoxemia and laminitis. Resveratrol, a plant-derived antioxidant, has been shown to exert a powerful anti-inflammatory effect in laboratory animals. This novel study will investigate resveratrol's potential to prevent and manage systemic inflammation and endotoxemia in horses. If resveratrol successfully acts as an anti-inflammatory agent in horses, it may have the potential to help prevent laminitis.

## INFECTIOUS DISEASES

### Determining Prevalence of and Predisposing Factors for Fractures in Warmblood Foals

Michelle Crupi, Western University of Health Sciences, D12EQ-611

Project Cost: \$5,500

Lower forelimb fractures in foals are fairly prevalent, and these horses may experience subsequent complications. This study proposes that hoof shape and forelimb conformation are predisposing factors to these injuries. The student will help assess the occurrence and prevalence of lower forelimb fractures in 40 warmblood foals. Digital radiographs and photographs of the foals' forelimb hooves will be taken every six weeks. The images will be used to evaluate and measure the foals' hoof shape, development and lower limb conformation and to assess for possible correlations between hoof conformation and incidence of lower forelimb fracture. The findings may help prevent these injuries in foals.





## METABOLIC DISORDERS

### Identifying Genes That Provide Insight into Equine Metabolism

Kristen Cleary, University of Minnesota, D12EQ-612

Project Cost: \$3,500

Horses evolved in an environment in which natural selection favored those who could survive on sparse feed while still generating enough energy to outrun predators. Although the traits of metabolic efficiency and athletic ability have served the horse well for centuries, today's environment of abundant high-calorie feed and a leisurely lifestyle have created disease processes in horses that mirror many of those observed in humans. The goal of this project is to identify genes underlying extreme athletic ability and whole-body energy metabolism in two breeds, the thoroughbred and the standardbred. Identification of these genes will lead to insight into energy regulation and could detect inadvertently selected traits that underly disease processes.

## NEUROLOGICAL DISORDERS

### Determining Factors Linked to Neurological Disease Outbreaks

Hanna Telama, University of Helsinki, Finland, D12EQ-614

Project Cost: \$5,500

Acquired equine polyneuropathy (AEP) is a relatively new neurological disease that has emerged in Nordic countries. Nearly 100 outbreaks of AEP have been documented in Finland, Norway and Sweden in the past 15 years. The primary characteristic of AEP is hind limb paralysis, and about 50 percent of the cases result in recumbency and death. Toxins present in roughage are suspected to be the most likely cause of the disease. The student will gather detailed information about the epidemiology of AEP outbreaks in Finland from 2005 to present. The data will be used to determine factors contributing to AEP outbreaks. Based on the results, the survey will be revised and used to collect information about all future outbreaks of AEP.

## PAIN MANAGEMENT

### Comparing Anti-inflammatory Drugs Used to Treat Pain in Horses

Rosemary Cullander, University of Glasgow, United Kingdom, D12EQ-622

Project Cost: \$4,000

To reduce the pain and inflammation associated with lameness, colic or surgery, horses are commonly given nonsteroidal anti-inflammatory drugs (NSAIDs), such as flunixin meglumine (Banamine) and phenylbutazone (bute). However, these drugs can cause severe side effects, including damage to the intestine and kidneys, and can result in the death of the horse. Newer medications known as COX-2 (cyclooxygenase 2) selective NSAIDs have been developed with the aim of preventing these side effects. In this study researchers will compare the effects of traditional, routinely administered NSAIDs with those of a newer COX-2 selective NSAID and then compare the information learned with previous clinical data to determine the best outcomes.

### **PAIN MANAGEMENT**

#### **Reducing Inflammation in Horses with Endotoxemia**

Kyle Fuller, Michigan State University, D12EQ-608

Project Cost: \$5,500

Endotoxemia is a severe inflammatory condition caused by the presence of lipopolysaccharide (LPS), a bacterial toxin, in the circulatory system. An estimated 25 to 40 percent of horses hospitalized for colic or septicemia have LPS in their blood, and this is associated with increased morbidity and mortality. Endotoxemia is often the underlying cause of illness and death in numerous equine conditions. Current treatments have limited success because they fail to correct the underlying inflammatory condition. The goal of this study is to determine whether lidocaine, a commonly used analgesic agent, can reduce inflammation caused by LPS better than the current standard treatment, flunixin meglumine (Banamine). The student will treat equine cells with either lidocaine or Banamine and then measure the reduction in inflammatory response. Results will be used to determine the clinical dose of lidocaine that is effective in treating and preventing the debilitating complications of endotoxemia.

### **RESPIRATORY DISEASES**

#### **Determining Genetic Factors That Make Horses Susceptible or Resistant to Recurrent Airway Obstruction**

Sharmila Ghosh, Texas A&M University, D12EQ-607

Project Cost: \$3,500

Recurrent airway obstruction (RAO), also known as heaves, is an asthma-like inflammatory disease affecting mature horses. The causes of RAO are not yet well understood but are thought to be both environmental and genetic. The student will help with genetic studies that will analyze whether resistance or susceptibility to RAO is associated with genetic variations in horses. The results will facilitate improvement of health in horses and benefit the equine industry. The research is also expected to generate results for conference presentations and for one publication.





## RESPIRATORY DISEASES

### Analyzing Changes in Equine Immune Systems That Prevent Pneumonia

Jessica Gilbertie, Iowa State University, D12EQ-605

Project Cost: \$5,500

Pneumonia is the most common cause of morbidity and mortality in neonatal foals. The immune systems of foals under the age of six months are still developing and are not yet capable of overcoming certain diseases, such as foal pneumonia. Molecules within white blood cells, known as the reactive oxygen and nitrogen species (RONS), are vital for killing pneumonia pathogens. Previous research has demonstrated that certain messenger proteins can influence the production of RONS in white blood cells of adult horses. More research is necessary to determine whether these messenger proteins drive the production of RONS in neonatal foals. The results of this study are expected to help identify foals at risk and develop drug therapies for prevention of and recovery from respiratory disease.

## RESPIRATORY DISEASES

### Identifying Proteins That Increase Severity of Heaves in Horses

Lauren Bright, Mississippi State University, D12EQ-601

Project Cost: \$5,500

Summer pasture-associated recurrent airway obstruction, also known as heaves, is a seasonal respiratory disease affecting 3 to 5 percent of grazing horses in the southeastern United States. The disease is similar to human asthma and worsens as the horse ages. One characteristic of heaves is a large influx of a particular type of white blood cell, the neutrophil, which is associated with severe disease. This project uses a new technology, proteomic analysis, to identify proteins in the airway fluid of horses that have heaves. The student will look at proteins in the lungs of horses with heaves and healthy horses and compare their ability to recruit and activate neutrophils. These proteins and the biological pathways they follow can be used in future research to test and evaluate therapeutic interventions for heaves.

“ This research experience has definitely shown me all the possibilities available in this field and provided me with valuable mentorship and guidance. Thus, I would like to thank you once again for making this opportunity possible for me. Your support is very much appreciated. ”

— Lydia Lam, University of California–Davis

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### STOMACH/GASTROINTESTINAL

#### Developing a Primary Cell Culture to Investigate Equine Gastrointestinal Disease

Lee Mueller, University of Glasgow, United Kingdom, D12EQ-621

Project Cost: \$4,000

Nonsteroidal anti-inflammatory drugs (NSAIDs) are commonly used in colic treatment to relieve pain and systemic inflammation (endotoxemia). However, some NSAIDs, such as flunixin meglumine (Banamine), prevent recovery of the mucosal barrier of the intestinal wall, which allows bacteria to penetrate the barrier and inhibits recovery. Studies into new drug therapies often must involve use of live horses as no bank of equine intestinal cell cultures is available. The goal of this project is to develop a primary cell-tissue culture model to allow laboratory study of equine intestinal cells. Preliminary data have established the feasibility of equine intestinal cell growth in low-serum media (cultures). Intestinal cell cultures would allow future innovation for intestinal physiology, pharmacology and toxicity studies.





## BLOOD DISORDERS

### Evaluating the Effects of Transfusion Techniques in Alpacas

Dustin Galbraith, Oregon State University, D12LA-602

Project Cost: \$5,500

In the past, blood transfusions appeared to be effective in llamas and alpacas, leading to the belief that transfused camelid red blood cells were fairly long-lived. Recent evidence, however, suggests that transfused blood cells break down rapidly. The cause is unknown, but it is presumed to result from a change in transfusion technique. The purpose of this project is to compare new blood-pump transfusion techniques to older gravity-fed transfusion techniques to assess their effect on transfused red blood cell life span.

## GENETICS

### Identifying Genes Linked to Deafness in Alpacas

Felipe Avila, Texas A&M University, D12LA-601

Project Cost: \$3,500

Congenital deafness is associated with white coats and blue eyes in several mammalian species, including alpacas. Because alpacas are bred worldwide for fiber color, and white coats are prized among breeders, it is essential to identify the genetic basis for the association between the white coat–blue eyes trait and congenital deafness so that breeders can avoid the inadvertent selection for congenital deafness. Yet no causative genes and mutations have been identified in this species. The objective of this research is to identify and isolate regions of the alpaca genetic sequence that contain genes for congenital deafness associated with white coat and blue eyes. The results will contribute to a better understanding of the genetic background of these traits in alpacas and will facilitate the development of molecular markers for breeding and diagnostics.



## IMMUNOLOGY

### Evaluating Camelid Immune Response to Insect Bites and Potential Allergens

Emily Nietrzeba, University of California–Davis, D12LA-604

Project Cost: \$5,500

Camelids appear to have hypersensitivity to insect bites and an increase in specialized white blood cells in response to parasitism and allergic and anaphylactic reactions to biting insects. The student will help determine whether alpacas produce antibodies that are capable of prompting a hypersensitive immune response to a potential allergen and determine whether the immune response is short lived or persistent. The identification of these antibodies could lead to the development of insect-bite and allergen-sensitivity diagnostic tests and desensitization strategies for camelids. New knowledge in this area may also help identify and prevent adverse vaccine reactions.

## METABOLIC DISORDERS

### Evaluating Treatment for Lack of Milk Production in Camelids

Lauren Henderson, University of Missouri, D12LA-603

Project Cost: \$5,500

Lack of milk production, known as agalactia, is a common problem in South American camelids, and the problem is often associated with devastating illness and death of newborns. Oral doses of domperidone have been successfully used to induce milk production in horses, but little is known about the drug's effectiveness in treating agalactia in camelids. The student will help to establish baseline data for oral domperidone, will use these data to measure the daily peak concentrations of domperidone during oral dosing regimens and will assess the influence of treatments on milk-production hormone concentrations. If the results reflect that oral dosing leads to drug absorption and alterations in milk-production hormone concentrations, these studies will provide the information needed to conduct future clinical trials. If the drug is not absorbed, these data will provide useful information for veterinarians considering domperidone as a therapy for agalactia in camelids.

*“ I really enjoyed working in a research team, and I would really like to repeat this experience in the future. I would also like to continue to conduct research. ”*

— Jorge Diaz, University of La Plata, Argentina

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## AMPHIBIANS/FISH

### Testing Freezing Techniques for Amphibian Sperm

Matthew Dowling, University of Tennessee, D12ZO-643

Project Cost: \$5,500

Amphibians worldwide are facing an extinction crisis, and it is evident that the world will continue to lose amphibian species if conservation efforts are not implemented and perfected. One up-and-coming amphibian conservation effort that has proven successful is artificial fertilization of eggs with hormonally induced sperm. Although sperm-storage techniques have long been perfected and practiced in mammals, only one study to date has examined appropriate cryopreservation of hormonally induced sperm from amphibians. The student seeks to establish effective cryopreservation techniques for amphibian sperm, which could ultimately have a tremendous impact on amphibian wildlife conservation.

## AMPHIBIANS/FISH

### Identifying Pathways of the Spread of Nonnative Parasites to Stream Fish in Hawaii

Roderick Gagne, Tulane University, D12ZO-634

Project Cost: \$5,500

The introduction of nonindigenous fish to the Hawaiian Islands has resulted in the introduction of parasites and has led to parasite spread worldwide. In this study, the student will compare parasite infection of *Awaous guamensis*, one of five native freshwater fishes in Hawaii, across 25 watersheds. The goal is to determine whether parasitism of native fish is related to the presence and density of nonnative Poeciliids, a family of freshwater fish living in some of the watersheds. The results will provide essential information for the conservation of Hawaiian stream fish and provide insight into the global spread of nonnative parasites and pathogens.

## AMPHIBIANS/FISH

### Determining Baseline Blood Values for Green Frogs on Prince Edward Island

Tricia Fleming, University of Prince Edward Island, Canada, D12ZO-631

Project Cost: \$5,500

Baseline data are essential for monitoring and improving the health status of all animals. This project will be the first concerted effort to establish normal blood reference values for green frogs on Prince Edward Island, Canada. The results of this study will not only help monitor and improve the welfare of the green frog, but the green frog could also be used as an indicator species for monitoring the effects of climate change and environmental alteration and degradation on ecosystem health.

### AMPHIBIANS/FISH

#### Improving Nutrition and Care of Captive Sea Horses and Other Fish

Véronique LePage, University of Guelph, Canada, D12ZO-617

Project Cost: \$5,500

Captive monitoring and reproduction of sea horses, pipefish and sea dragons have been practiced for decades, and animal care protocols have greatly improved; however, there is still little known about disease in these fish. Because so little is known about diseases affecting these animals in captivity, it is very challenging to treat and nearly impossible to prevent disease. The student hopes to optimize nutrition, refine treatment methods and alter husbandry methods in these fish. Results from this study could improve survival rates in captivity and reduce the demand to acquire these animals, many of which are threatened, from the wild.

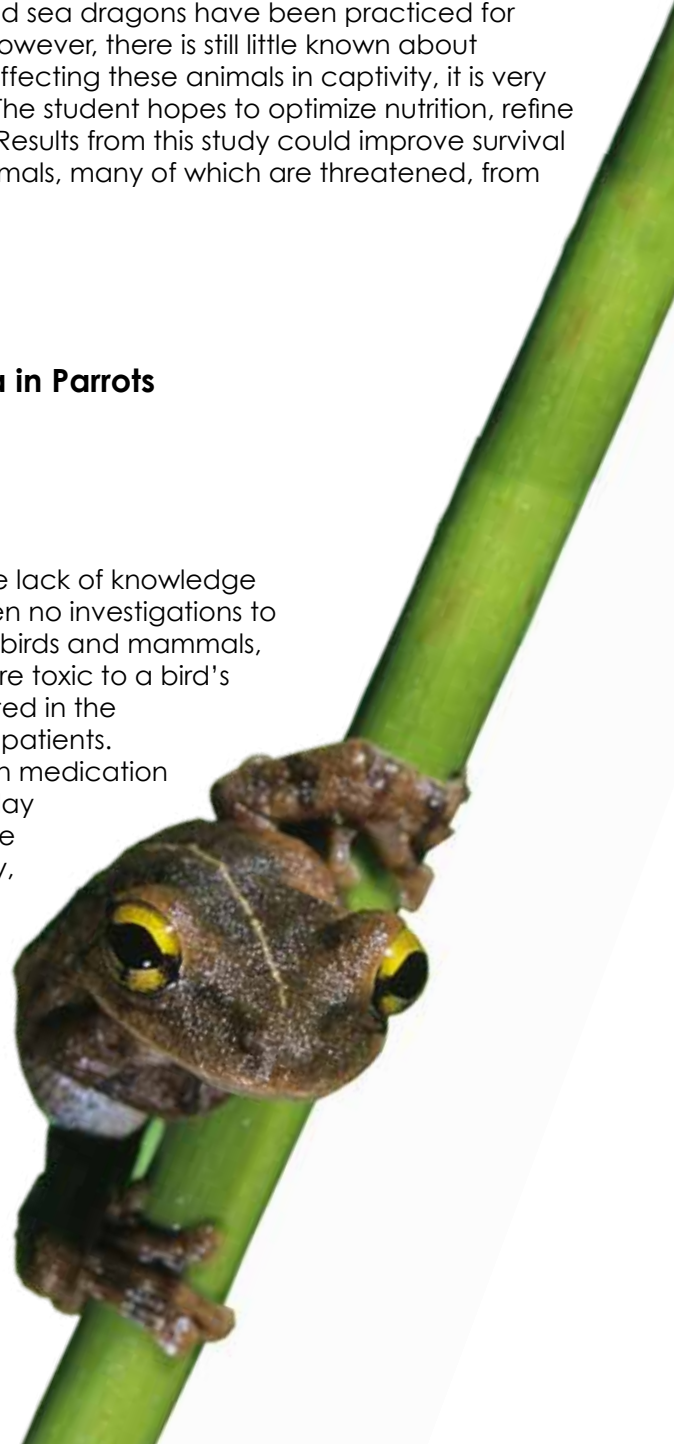
### BIRDS

#### Identifying Appropriate Dosages for Local Anesthesia in Parrots

Melissa Newman, Louisiana State University, D12ZO-648

Project Cost: \$5,500

The health of avian species has been adversely affected by the lack of knowledge regarding pain management in birds. Although there have been no investigations to determine whether local anesthetic agents function similarly in birds and mammals, there is an unsubstantiated belief that local anesthetics are more toxic to a bird's cardiovascular and central nervous system. This belief has resulted in the withholding of pain management via local anesthesia in avian patients. The student will help determine an appropriate dose of the pain medication lidocaine that won't cause side effects in birds. This project will lay the foundation for use of local anesthesia in avian species, have immediate significant clinical application and, most importantly, advance animal welfare through pain management.





## BIRDS

### Identifying How Parasites Affect Wild Bird Health in Calgary

Monica Kovacs, University of Calgary, Canada, D12ZO-641

Project Cost: \$5,500

Parasites can significantly affect the health of wild birds by reducing body condition, inhibiting reproductive success and increasing mortality. The student hopes to determine the biodiversity of parasites present in wild birds entering wildlife rehabilitation centers in and around Calgary and identify how these parasites may affect the health of the birds. In particular, she will study *Trichomonas*, an emerging parasite that causes significant disease and death in many bird species and has been studied in finches in eastern Canada and Europe. Results from this study may be vital in helping rehabilitation centers determine the best course of treatment for birds and improve the level of care administered. This study will also provide baseline information to help detect new and emerging diseases.

## BIRDS

### Assessing Physiological Effects of Lead Exposure in Wild Ducks

Gabriela Novacovsky, University Center of the Province of Buenos Aires, Argentina, D12ZO-636

Project Cost: \$5,500

Poisoning of wildlife from ingestion of lead pellets is a worldwide problem in areas where hunting occurs, but the impact of lead pollution hasn't been studied in the Argentine wetlands. The effects of lead toxicity can be subtle and hard to recognize, which makes lead a silent, dangerous toxicant. Although lead ammunition is now banned in some countries, the ban remains controversial and faces significant resistance. The student will explore the sublethal effects of lead in ducks, which may be threatened by intensive hunter-related mortality. Results will provide support for the design and implementation of effective corrective measures to hunter-related mortality in wildlife.

## BIRDS

### Gaining Insight Into Feather-damaging Behaviors in Captive Parrots

Kirsten van Bokhorst, Utrecht University, Netherlands, D12ZO-630

Project Cost: \$5,500

Among the many welfare-related problems in captive parrots, feather-damaging behavior is the most common. Feather-damaging behavior consists of all types of mutilation to the feathers accessible by the beak, including chewing, biting and plucking. The presence of this behavioral disorder suggests that the parrot's welfare is at risk and it can lead to medical problems. This study is designed to scientifically establish whether there is a correlation between feather-damaging behavior and types of behavioral responses to new stimuli (coping strategy). Results from this study will help scientists to gain further insight into the causes and risk factors of feather-damaging behavior in captive parrots. The findings may also lead to screening tests that would play a vital role in preventing the problem.

## BIRDS

### Examining Avian Flu Transmission Among Birds

Alicia Bruce, University of California–Davis, D12ZO-622

Project Cost: \$5,500

Wild birds are known carriers of avian influenza virus, commonly known as bird flu, but transmission between individual animals and the environment is not fully understood. The student will investigate avian influenza virus transmission among mallards in a California Central Valley urban pond setting, specifically looking at transmission across seasons and between adult and juvenile mallards. The California Central Valley is a principal stopover site for nearly 6 million birds migrating within the Pacific Flyway flight route each year. Results of this study could affect management of the environment and resident waterfowl in these areas and identify whether additional urban pond areas need to be studied with regard to spread of avian influenza and other diseases.

## ELEPHANTS/HIPPOS/RHINOS

### Testing for Organism That Causes Fatal Disease in Rhinos

Nathaniel LaHue, Cornell University, D12ZO-613

Project Cost: \$5,500

With a population of fewer than 275 and decreasing, Sumatran rhinoceroses in Indonesia are critically endangered. A significant threat to captive and wild Sumatran rhinos, as well as to the rarer Javan rhinoceros that lives nearby, is *Trypanosoma evansi*. This protozoa causes surra, a disease that infects the blood of the vertebrate host, causing fever, weakness and lethargy, which, in turn, lead to weight loss and anemia. In rhinos the disease is most often fatal, and it caused the loss of a previous captive breeding population. The student will test for *Trypanosoma evansi* in rhinos at the Sumatran Rhino Sanctuary, captive elephants at the Way Kambas Elephant Training Center and domestic cattle and water buffalo in villages surrounding a national park. Results from this study will assist in conservation efforts for this highly endangered species of rhinoceros.

“ Thank you for sponsoring my summer research experience through Morris Animal Foundation. This project was a continuation of research I have been working on for the past three years. With your contribution, I was able to complete a portion of the project that was never possible before. ”

— Laura Eberlein, University of Tennessee

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## FOXES/WILD DOGS/WOLVES

### Studying Hyenas as a Sentinel for Infectious Disease in Wild Dogs

Andrew Flies, Michigan State University, D12ZO-604

Project Cost: \$3,500

Wildlife disease outbreaks can have major effects on conservation efforts and overall ecosystem stability. Canine distemper virus (CDV) and rabies were major factors in the extirpation of wild dogs from the Maasai Mara National Reserve in Kenya. A CDV outbreak in the Serengeti–Mara ecosystem in East Africa also killed more than 1,000 lions in 1994. Major mortality events such as these can alter long-term species survival. Domestic dog populations are a likely source for CDV and rabies outbreaks in the Serengeti–Mara ecosystem. This study aims to use spotted hyenas as sentinels for wildlife pathogens in order to understand the infectious disease dynamics of wildlife in protected conservation areas. Information about current infections in spotted hyenas could help quickly identify the disease agent and allow for more informed decisions when implementing vaccination plans and responding to disease outbreaks.

## MARINE MAMMALS

### Determining Risk Factors Associated with Neurologic Disease in Rehabilitated Harbor Seals

Allison Peterson, Michigan State University, D12ZO-619

Project Cost: \$4,000

Marine mammals suffer from displacement, diseases and injury because of their constant interactions with humans. Sick or injured animals are brought to rehabilitation centers, which work to return them to health and release them back to the wild. The student will investigate the cause of neurologic disease in a group of rehabilitated harbor seals. She will identify the development of neurologic signs and risk factors and determine how vitamin B deficiency plays a role in the incidence of this disease. Results from this study will assist in the long-term health management of harbor seals and other marine mammals.



## MARINE MAMMALS

### Combating Starvation in California Sea Lions Entering Rehabilitation Centers

Karisa Tang, University of California–Davis, D12ZO-610

Project Cost: \$5,500

Increasing numbers of California sea lions are entering rehabilitation centers and are often suffering from starvation. The first week in rehabilitation is critical to survival, and although there are protocols for feeding domestic species, the nutritional requirements for sea lions are unknown. This study seeks to regularly measure separate electrolyte values of sea lions during their first week of rehabilitation and to provide nutritional supplements for animals that are deficient. Through this treatment, the goal is to increase survival rate in the first week of rehabilitation. The researchers will also examine the enzymes necessary for synthesizing glucose, which may be interrupted by prolonged starvation. Results from this study could lead to new rehabilitation protocols that will lead to increased survival rates. These protocols, once established, could also serve as a model for examining starvation in other marine mammals.

## MULTIPLE SPECIES

### Identifying the Prevalence of Invasive Species in Harbors and Ports

Thibault Gleyzes, National Veterinary School of Toulouse, France, D12ZO-623

Project Cost: \$5,500

The introduction of nonindigenous species is one of the biggest threats to biodiversity. When new species invade an environment, the native populations may then suffer from predation, competition, habitat alteration and the introduction of new diseases and parasites. Waterway ports and harbors are ideal places for testing theories about associations between invaders and the natural environment. The student will examine artificial structures, such as docks, boat hulls and pontoons, and natural structures, such as reefs, to compare the diversity of invasive species growing on each.

“ My involvement in the project has cemented my interest in research, particularly in the area of wildlife. The opportunity has certainly encouraged me to consider this much more seriously for my future career. Once again many thanks for the support of my project. It is much appreciated. ”

— Laura Waring, Royal Veterinary College, United Kingdom

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## PRIMATES

### Identifying Parasite Infection in Endangered Black Howler Monkeys

Jonathan Bodager, Emory University, D12ZO-646

Project Cost: \$5,500

Ongoing habitat disturbance and loss is significantly affecting the long-term survivability of the endangered black howler monkey. Although habitat disturbance and overlap with humans and livestock are known to reduce the abundance of some primate species, the potential role of parasite infections in such primate population declines remains largely unexplored. The student will noninvasively compare patterns of infection with potentially pathogenic protozoa and associated illness in groups of black howler monkeys that have varying degrees of contact with humans and livestock. The findings will help to identify potential pathogen transmission pathways from humans and domestic animals to black howler monkeys.

## PRIMATES

### Identifying How Malaria-causing Parasites Spread Among Primates

Mary Thurber, University of Wisconsin, D12ZO-637

Project Cost: \$5,500

Malaria is a mosquito-borne parasitic disease caused by *Plasmodium* spp. Although most species of *Plasmodium* are not zoonotic, the strain that seriously affects humans (*Plasmodium falciparum*) is thought to have originated in nonhuman primates. Understanding how different species of primates serve as hosts for different species of *Plasmodium* is crucial for determining how these parasites spread among species and for controlling or eradicating malaria in Africa. The student will conduct an ecological analysis of *Plasmodium* and *Hepaticocystis* spp. (a nonpathogenic relative of *Plasmodium*) in wild primates in Kibale National Park, Uganda. By combining infection data with long-term ecological and behavioral data, the student will learn how host ecology contributes to the transmission of parasites. This study could provide a model of zoonotic disease transmission to humans and ultimately contribute to improvements in preventive health and conservation in Uganda and worldwide.

“ Through research, we are capable of unveiling many things, waiting to be discovered, that help to ensure not just our health, but also animals' and ecosystems' health, because we are all interconnected to planet Earth. ”

— Viviana González-Astudillo, La Salle University, Colombia

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## REPTILES

### Developing Pain Management Protocols for Snakes

Allison Gutwillig, University of Wisconsin, D12ZO-642

Project Cost: \$5,500

Pain management is not adequately understood in many nondomestic species, particularly snakes. An inability to determine when a snake is experiencing pain makes it difficult to understand how pain medications work in these species and what the potential side effects may be. The student hopes to develop clinically relevant and effective pain management protocols for use in snake species. Results from this study could provide an immediate benefit for snake patients in the form of a safe and effective pain management.

## REPTILES

### Evaluating the Nutritional Health of Hawksbill Sea Turtles of St. Kitts

Jon Romano, Ross University, St. Kitts, D12ZO-635

Project Cost: \$3,500

Hawksbill sea turtles play a crucial role in determining the biodiversity and structure of the Caribbean reef ecosystem. They are a keystone predator, feeding primarily on sponges. After centuries of unsustainable harvesting, hawksbill populations have dramatically declined, and the species is currently considered to be critically endangered. Because they are highly migratory, studying them can help to assess the health of the entire marine ecosystem. The student hopes to establish health parameters for foraging juvenile hawksbills, determine the species of sponges they commonly eat in the waters of St. Kitts and complete a nutritional analysis on the most commonly consumed sponges. Data could be used to monitor the health of this species of sea turtle in the wild and the health of the local marine ecosystem of St. Kitts and may provide insight on the nutritional needs of captive turtles.

## REPTILES

### Developing a Better Understanding of the Turtle Immune System

Estelle Rousselet, University of Connecticut, D12ZO-626

Project Cost: \$5,500

There is growing concern about the survival of endangered loggerhead sea turtles. Stranded animals, which are debilitated or face health issues, require specific medical management that will lead to their recovery and protection. More information is needed to understand diseases and transmission factors affecting these animals. Blood work is commonly used to assess the health status of sea turtles, but these tests fail to assess the functionality of immune cells. The student will compare health parameters and examine the functional activities of different blood cell types involved in the immune system of turtles affected by septicemic cutaneous ulcerative disease and those unaffected. Results from this study will provide further understanding of the immune system of this turtle and will likely guide veterinarians in improving treatments.



## WILD CATS

### **Determining the Link Between Urbanization and Feline Immunodeficiency Virus in Bobcats**

Danielle Lagana, Colorado State University, D12ZO-614

Project Cost: \$5,500

Bobcats are susceptible to habitat fragmentation, making them valuable indicators of the connections between different habitats and species in an ecosystem. Rapid human population growth and urban development in Florida, California and Colorado have significantly affected the connectivity of natural habitats in these areas. The student will evaluate the relationships among bobcats in three geographically isolated populations experiencing a range of urbanization and will provide information about feline immunodeficiency virus infections in these populations. Results from this study will help scientists construct models to relate urbanization with exposure to potential disease agents, which will also assist in conservation planning.

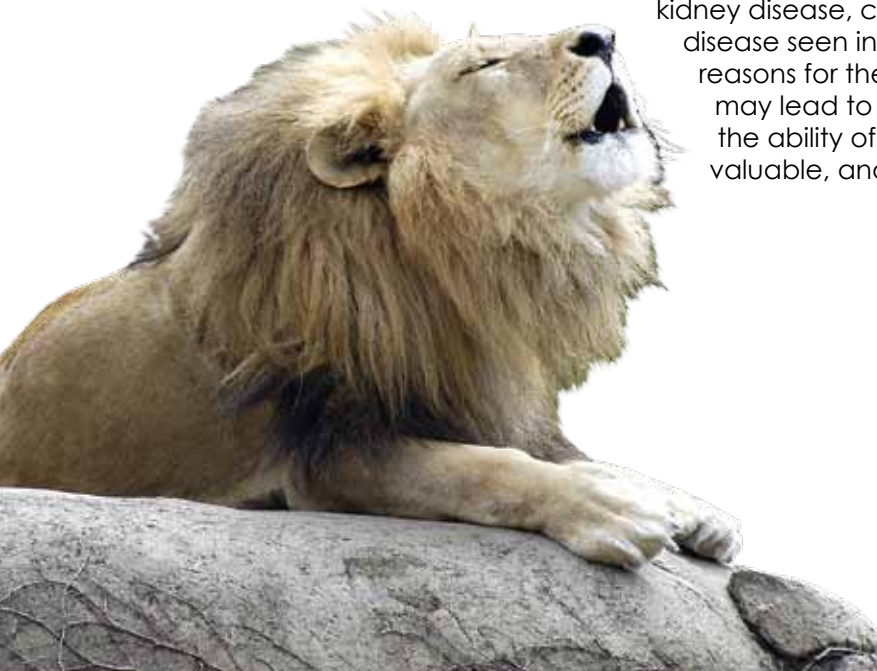
## WILD CATS

### **Characterizing Chronic Kidney Disease in Captive Wild Cats**

Jenna Donley, University of Sydney, Australia, D12ZO-602

Project Cost: \$5,500

Chronic kidney disease is common in older nondomestic cats in captivity; however, there is little information about this sometimes fatal condition in species other than captive cheetahs and Iberian lynx. The goals of this study are to characterize the types of kidney disease observed in all captive nondomestic cats in two Australian zoos, identify potential predisposing factors leading to kidney disease, compare the prevalence and type of kidney disease seen in each nondomestic cat species and formulate reasons for the differences seen. The outcome of this study may lead to prevention strategies that will vastly improve the ability of zoo managers to protect and care for these valuable, and in many cases endangered, wild cats.



## WILD HOOVED ANIMALS/RUMINANTS

### Testing Methods for Detecting Chronic Wasting Disease

Alexandra Van de Motter, Colorado State University, D12ZO-639

Project Cost: \$5,500

Prion diseases are fatal neurodegenerative diseases found in mammals. Chronic wasting disease (CWD) is the only known prion disease affecting free-range deer, elk and moose. A significant limitation to the management of CWD is the inability to rapidly and sensitively identify infected animals. The objectives of this study are to determine the sensitivity, specificity and utility of two methods of detecting CWD in white-tailed deer. The development of these two methods could improve disease detection in live animals and food products and enhance the understanding of this disease in cervid and non-cervid species.

## WILD HOOVED ANIMALS/RUMINANTS

### Determining Prevalence of Alphaherpesvirus in Alaskan Caribou

Mary Wood, University of Minnesota, D12ZO-627

Project Cost: \$5,500

Alphaherpesviruses can infect many domestic and wild hoofstock species and are easily transmitted among animals living in areas of high density. These viruses cause respiratory and reproductive problems that can greatly affect the health of caribou and semidomestic reindeer populations. Currently, the role of alphaherpesviruses in the health of caribou populations in Alaska is unknown. The student will examine 30 years of blood samples from two different Alaskan caribou herds, one of which has been in contact with semidomesticated reindeer, to determine the prevalence and species of alphaherpesviruses in these populations. The results from this study will provide scientists with an understanding of alphaherpesviruses in these herds and whether these viruses could have been introduced from semidomesticated reindeer.

“ Thank you again for your generosity. I appreciate the opportunity to supplement my education in ways that I find extremely important. ”

— Christine Simecka, Oklahoma State University

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## WILD HOOVED ANIMALS/RUMINANTS

### Comparing the Toxicity of Strains of *Mannheimia haemolytica* in Bighorn Sheep

Kathleen White, Washington State University, D12ZO-625

Project Cost: \$5,500

Various factors, including disease, have caused the dramatic decline of the bighorn sheep population in North America over the past 200 years. Pneumonia is the most significant disease that causes mortality in these animals, and it often occurs after bighorn sheep come into contact with domestic sheep. *Mannheimia haemolytica*, a bacteria normally found in healthy animals of both species, has been isolated in bighorn sheep with pneumonia. Preliminary studies show that a strain of *M. haemolytica* in domestic sheep may produce a toxin that causes disease only in bighorn sheep. When bighorn and domestic sheep come into contact with each other, bighorn sheep may acquire the more toxic strain of bacteria, causing pneumonia. The student will compare strains of *M. haemolytica* found in both species to see if there is a difference in their ability to produce this toxin. The findings may help in the development of management strategies for reducing big horn sheep mortality.

## WILD HOOVED ANIMALS/RUMINANTS

### Evaluating a Way to Control Parasites in Captive Hoofstock

Macy Trosclair, Louisiana State University, D12ZO-612

Project Cost: \$5,500

Gastrointestinal parasites are a major problem affecting exotic and domestic hoofstock worldwide. The long-term use of broad antiparasitic drugs, combined with confined forage-limiting areas, make zoological facilities prime locations for gastrointestinal parasite populations. These institutions are in critical need of an effective alternative method of controlling parasites. The student will evaluate whether feeding hoofstock the spores of a parasite-trapping fungus, *Duddingtonia flagrans*, will reduce levels of parasitic larvae on ground forage of confined grazing areas. Giraffe, sable antelope and blackbuck will be studied specifically. Long-term success of this study could drastically improve the quality of life of captive hoofstock.



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Ray Cassel

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