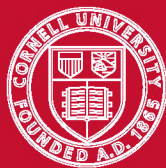


Scientific  
Breakthroughs  
**TRANSFORM**  
Veterinary Care



BAKER INSTITUTE  
FOR ANIMAL HEALTH

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**NEW FOR 2016!** View the expanded annual report online at [www.bakercornell.org](http://www.bakercornell.org). Look for these icons throughout the report for expanded material.

## EXECUTIVE SUMMARY

The Baker Institute for Animal Health continues to make discoveries that are changing veterinary medicine and making a better world for animals and humans alike. Notable achievements of the 2016 fiscal year include:

- **Twenty-eight active grants.** In the past year, our faculty members have been actively engaged in 28 different research projects supported by our donors and by federal, state, and university granting agencies.
- **New research initiatives in canine health.** Our faculty have undertaken three major collaborative projects focused on the health of dogs. These studies will enhance our understanding of how the canine immune system works, the causes and possible fixes for inherited diseases in dogs, and discover new treatments for a common form of canine cancer.
- **World's first puppies born by *in vitro* fertilization.** The Baker Institute proudly announced the birth of the world's first *in vitro* puppies, an accomplishment that will help preserve endangered canid species and open new means for discovery in human and canine genetic disease.

We are also proud to introduce the Institute's new Director, Dr. Luis M. Schang, who brings a fresh and energetic vision to the Institute and our programs. Schang has an active research program in virology that promises to expand our basic understanding of infection and bring innovative new antiviral drugs to market.





## DIRECTORS' MESSAGE

We are pleased to send you this update about the scientific discoveries our faculty, staff, and students have made at the Baker Institute for Animal Health in the past year. This year also brings a change in leadership for the Institute as Dr. Colin Parrish, Director since 2010, steps down and Dr. Luis M. Schang assumes the role. We hope you will be as excited as we are by the Institute's accomplishments, and that you also are looking forward to a better future for the animals who bring so much joy and richness to our lives.

New discoveries are the goal of every scientist, but like you, we are all animal lovers at the Institute, so it is important to us that our research helps create a better future for domestic and wild animals. Dr. Elia Tait Wojno, for instance, is closely studying the canine immune system, research that will answer basic questions about how immunity and allergies develop in dogs and to provide new insights that will spur vaccine and drug development. In his laboratory, Dr. Alex Travis is seeking the answers to fundamental questions about fertility. His work with *in vitro* fertilization in dogs is aimed at helping wild dog and wolf species survive and helping to correct inherited diseases in dogs and humans alike.

This work of discovery will continue with Dr. Schang as Director. As he settles into this new role, Dr. Schang will seek to connect with Institute faculty, staff, and trainees, with the entire College of Veterinary Medicine, and with the Institute's new and long term supporters. Together with all





these stakeholders, he will develop a vision for the future that builds on the long tradition of the Institute making discoveries and translating them into real benefits for animal health. He also wants to connect with donors and supporters like you, and welcomes any questions or suggestions you may have for him about the future of the Institute, or about his background, his research, or his vision.

As always, the partnership we have with you, our supporters, is the key to our success and a driving force in our programs. With your support, we see a hopeful future for treating cancer, infectious disease, genetic abnormalities, and other causes of illness and early death in animals. We're looking forward to the better future we can achieve together.

Thank you for your continued contributions to this unique collaboration.

Sincerely,



Colin R. Parrish  
*Director Emeritus*



Luis M. Schang  
*Director*

Learn more about  
our new Director,  
Luis M. Schang  
on page 16.



## RESEARCH UPDATES



ONLINE VIDEO ▶

View video updates at [www.bakercornell.org](http://www.bakercornell.org)



## Genetics and immune reactions in the horse

Dr. Doug Antczak's research in the past year has focused on projects comparing the genomes of horses and wild or domestic animals, and defining the interactions between the horse immune system and a common but devastating virus.

- **Genetics of the oryx, camel, and Arabian horse.** The Antczak lab is working with colleagues at Weill Cornell Medical – Qatar and at the University of Florida to sequence the genomes of these three iconic animals of the Middle East to develop sequences and databases that can be shared with scientists all over the world. They are also evaluating the level of genetic diversity in these species – important information for captive breeding programs of the endangered oryx populations and for breeding the healthiest Arabian horses and camels for racing or other uses.
- **Measuring immune activity to learn how to make a better vaccine.** Viruses in the herpes family present a tremendous challenge for vaccine development in horses and in humans. The weak immunity developed by current equine herpesvirus (EHV) vaccines contributes to the devastating repeated outbreaks of disease caused by this virus. By examining how EHV interacts with components of the immune system called T cells and the major histocompatibility complex molecules, Antczak and his colleagues from Berlin, San Diego, and Virginia have shown that the immune system of most horses are not well-tuned to the antigens this virus presents to the immune system. The goals of the studies are to develop new vaccines that can stimulate protective immunity to EHV.



## SCOTT COONROD, PHD

*Judy Wilpon Professor of Cancer Biology*

### Searching for simpler and targeted treatments for common cancers

Dr. Scott Coonrod focuses his research attention on cancer, the out-of-control growth of cells that claims millions of animal and human lives every year.

- **Finding smarter treatments for a canine cancer.** In a dog-focused collaboration with Dr. Charles Danko, Dr. Gerlinde Van de Walle, and Dr. Roy Cohen, Coonrod's laboratory is working to find targeted treatments for hemangiosarcoma, a common and often untreatable form of cancer in dogs. Using new sequencing technologies developed in Danko's laboratory and mouse cancer models, Coonrod's team is identifying the genes that make these tumors tick, then they aim to test drugs specifically intended to target the pathways that those genes control.
- **Outsmarting cancer drug resistance.** The drug tamoxifen is often given to women following treatment for breast cancer to prevent the cancer from coming back, but breast cancer cells often become resistant to the drug. In another collaboration with the Danko laboratory, Coonrod is identifying the genes that make tamoxifen resistance possible in order to 1) stop those genes from making the switch to resistance, and 2) help identify cancer patients most at risk of tamoxifen resistance so that they can receive more effective alternative therapies.
- **Treatments for mammary cancer.** In ongoing work, Coonrod and his team are testing a new therapy for treating mammary cancer in animals and humans alike. The early results are promising and the drug may be headed to clinical trials in dogs soon.





## CHARLES DANKO, PHD

*Assistant Professor of Biomedical Sciences*

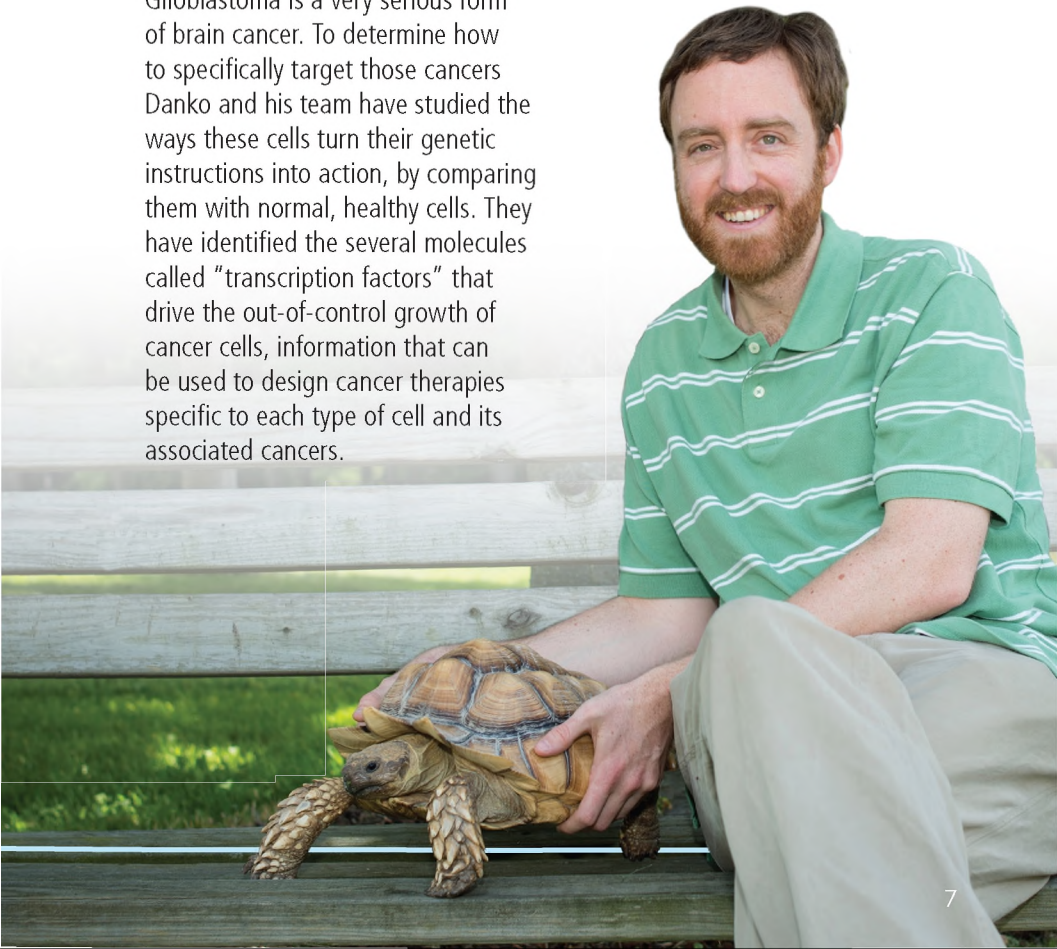
### How do cells read and interpret DNA to regulate life?

Dr. Charles Danko is interested in how DNA, the basic blueprints for all living things, is interpreted by cells to produce living, breathing organisms. He also explores how diseases like cancer change these interpretations and impact health.

- **Understanding how evolution determines human and animal differences.** The genes of humans, dogs, cats, horses, and mice aren't all that different. Danko and his collaborators are studying the roles of "gene enhancers" in evolution. Gene enhancers are small parts of the genome that can ramp-up or -down the number of times a gene is transcribed into RNA and ultimately translated into the proteins that make up the functional differences between the animals.

- **How cancer cells use genes differently.**

Glioblastoma is a very serious form of brain cancer. To determine how to specifically target those cancers Danko and his team have studied the ways these cells turn their genetic instructions into action, by comparing them with normal, healthy cells. They have identified the several molecules called "transcription factors" that drive the out-of-control growth of cancer cells, information that can be used to design cancer therapies specific to each type of cell and its associated cancers.



## Resolving the genetic disorders that plague dogs

Like humans, dogs are occasionally born with birth defects, and they occur more frequently in some breeds. In the case of XX DSD, a disorder of sexual development, affected puppies that have normal female sex chromosomes (XX) are born with masculinized genitals and are often infertile or sterile. XX DSD is a documented problem for 28 breeds of purebred dogs, including in particular American cocker spaniels and German shorthaired pointers. Dr. Vicki Meyers-Wallen's work focuses on tracking down the genetic reasons for XX DSD so that the disorder can be avoided or eventually eliminated from purebred dogs.

- **Locating the genetic "marker" for a genetic disorder.** Meyers-Wallen identified four dogs, some affected with XX DSD and some not, and sequenced their genomes – the entire DNA sequences in their cells. By comparing those sequences, Meyers-Wallen identified those that affected dogs have in common but which were not present in normal dogs and she then pinpointed the region and a specific sequence difference (marker) that could be responsible for XX DSD. She then found that same marker in affected dogs of several breeds, confirming the marker's role in canine XX DSD.
- **XX DSD changes how cells express their DNA information.** Meyers-Wallen studied reproductive organ development in dog embryos and found that cells that carry the XX DSD marker express genes differently than normal cells, explaining the abnormal development of the reproductive organs in the dogs with those mutations. This discovery will allow a genetic test to be developed to identify carrier animals, allowing for breeding of unaffected animals to avoiding this disease in the future.





## JOHN S. L. PARKER, BVMS, PHD

*Associate Professor of Virology*

### Tiny troublemakers: viruses

Work in John Parker's laboratory is focused on viruses that infect animals and the immune responses to infection. They're making discoveries that will enable better therapies and preventatives for treating common and devastating diseases.

- **Small differences between viruses make big problems.** Feline calicivirus can be mild or devastating, depending on the strain of virus involved. This year Parker and his colleagues discovered that tiny differences on the outside of the feline calicivirus can make the difference between life and death for cats. This is crucial information for diagnosing and treating the severe disease in cats during the outbreaks.
- **Harnessing antibodies to fight cancer.** Parker and his team have developed a system for harnessing the weapons of the immune system to fight feline cancer. They have created cat-specific antibodies that can attack cancer cells and are now collaborating with colleagues to test the antibodies in cats visiting the Cornell University Hospital for Animals who are suffering from lymphoma.



## The emergence of new viral diseases in dogs

The Parrish laboratory has been studying viruses that have emerged in dogs to cause new diseases. Together with his team, Parrish is showing in-detail how those viruses jumped into and spread between dogs and how they sometimes infect other animals – including cats and wild species.

- **Canine influenza viruses: emergence and spread.** There are currently two influenza viruses circulating in dogs in the USA – called H3N8 and H3N2 - and the Parrish laboratory is studying both. The most recent virus became an urgent concern for dog owners in the United States when a large outbreak of respiratory disease caused by the H3N2 strain of canine influenza began in the Chicago area in early 2015. Veterinarians turned to the Animal Health Diagnostic Laboratory in Cornell's College of Veterinary Medicine and to the Baker Institute for answers about that virus. Parrish and his team have been studying the virus responsible for the epidemic and are now pinpointing its relationship to influenza viruses infecting dogs elsewhere in the world, and also to influenza viruses that infect other animals, including humans. They have determined that the virus, which has since spread to dogs in dozens of states, came from Korea, where the virus has been spreading in dogs for many years.
- **Investigating ways to stop canine influenza.** Parrish and his colleagues are working with a team of experts from all over the country to compare the genetic signatures of both the H3N2 and H3N8 canine influenza viruses from regional outbreaks to track the spread of the disease, with the aim of determining new ways of controlling the viruses and eventually eradicating those viruses from dogs. The laboratory is also studying the biology of the canine influenza viruses to identify the properties that allowed them to be successful in dogs.
- **How parvovirus can pass from species to species.** The Parrish laboratory is also continuing work on canine parvovirus, which first emerged in the late 1970s as a brand new disease in dogs. Since then the virus appears to be frequently passed between dogs and wild animals, including raccoons, foxes, and skunks. Parrish and his colleagues have studied the simple particle structure that forms the outside of the virus and found that key changes alter the way the viruses interacts with cells and is largely responsible for the virus' ability to infect all these different species.



## ELIA TAIT WOJNO, PHD

*Assistant Professor of Microbiology and Immunology*

### Allergies: how the immune system can make your pet miserable

Dr. Elia Tait Wojno has been busy exploring the immune system when it functions correctly (to eliminate parasites) and when it malfunctions (resulting in allergic disease).

- **Similarities between dog and human allergies.** Tait Wojno and her team have studied blood samples from dozens of canine patients at the Cornell University Hospital for Animals, including dogs with skin itching, redness, rashes, and other allergic signs, and dogs without allergies. They found that allergic dogs have a specific type of immune cell in their blood, cells also found in allergic humans and mice. The discovery means that human treatments for these types of allergic signs could also work in canine medicine.
- **Studying how lipids affect inflammation.** To help identify new therapies for allergies and infection, Tait Wojno is exploring how the oily molecules called lipids affect the process of inflammation. Inflammation is common to both allergic disease and also to the host immune responses to parasitic worms, so some of the available drugs that act on lipids could be used to treat allergies or fight parasitic infections.
- **Exploring how the immune system develops.** In collaboration with scientists here at Cornell and at the University of Rochester, Tait Wojno's laboratory has begun studying how the cells of the immune system develop over a lifetime and what happens to make it all work correctly in animals and humans of different ages.



## ALEXANDER J. TRAVIS, VMD, PHD

*Associate Professor of Reproductive Biology*

### Studies of reproduction and diagnostics to create healthier animals and humans

Dr. Alex Travis's research explores a diverse set of subjects, ranging from assisted reproduction techniques to technologies based on the very smallest biological machines. Much of Dr. Travis's work stems from his studies of reproduction and the function of sperm.

- **World's first puppies born by *in vitro* fertilization.** (See page 14) Travis and his colleagues and students welcomed the first puppies born by *in vitro* fertilization on July 10, 2015 at the Baker Institute. This advancement could help preserve endangered canid species and also provide new strategies for preventing human and canine genetic diseases. The births are the first time this assisted reproduction technique, in which ova and sperm are brought together in a test tube to create embryos, has been successfully accomplished in dogs.
- **Diagnosing male infertility.** Not all sperm are capable of fertilizing an egg. Poor sperm function is a common cause of infertility in men, but there are currently few easy and accurate tests for diagnosing the problems involved. Knowing about the basis of the problem can help doctors direct a couple seeking to have a child to the assisted reproduction approaches that can serve them best. Building on his expertise in sperm biology, Travis and his team have developed a male fertility test that quickly scores the likelihood that a man's sperm will be able to successfully fertilize an egg. Travis has created a company which is now developing the commercial product and bringing it to market.
- **Rapid diagnosis of stroke, and other disorders.** Minutes count when treating stroke or other brain injuries, but current diagnostics take as long as three hours – during which time patients may be suffering from irreversible brain damage. Copying a molecular design they discovered in the sperm tail, Travis and his colleagues, including Baker Institute Research Scientist Dr. Roy Cohen, have developed a device that can diagnose stroke in less than ten minutes using less than a drop of blood. Having demonstrated proof of principle, Travis and Cohen are now expanding the technology to diagnose other conditions in humans and animals, including traumatic brain injury (concussion), some forms of dementia, and even some types of cancer and heart disease.

ONLINE VIDEO ▶

View research updates videos at [www.bakercornell.org](http://www.bakercornell.org)



## GERLINDE VAN DE WALLE, DVM, PHD

*Assistant Professor of Viral Pathogenesis*

### Seeking ways to treat cancer and to improve wound healing

A main focus of Dr. Gerlinde Van de Walle's research is exploring novel treatments for animal diseases. Currently, her lab is focused on finding drugs suitable for eliminating canine mammary cancer and evaluating the effectiveness of stem cell and related therapies for treating skin wounds in horses – which may be used in humans and other animals.

- **Identifying new treatments for canine cancer.** In an attempt to identify new drugs to treat mammary cancer in dogs, Van de Walle and her colleagues studied the effects of a human cancer drug called 5-Azacytidine on dog tumors. The drug reduced the ability of dog mammary cancer cells grown in the lab to form tumors, a very promising early result that could push this drug along to eventual use in treating canine cancer.
- **Stem cells to help horse wound healing.** Horses are prone to lacerations on their lower legs. These wounds heal slowly, and may lead to “proud flesh”, lumpy overgrowths of tissue that are susceptible to uncontrolled bleeding and bacterial infection. These wounds appear to be similar to the prominent scarring that can occur in humans after surgery. Van de Walle's group tested stem cells to determine whether those could aid the wound healing process in tissue samples. Their results show that the substances secreted by stem cells can prevent the scarring (proud flesh) from forming and also reduce the severity of existing scars. Van de Walle plans to carry the work forward to testing in horses, and to examine how those treatments may be used in other animals, including humans.



## RESEARCH HIGHLIGHT:

### World's first *in vitro* puppies born at the Institute

What has spots, 14 floppy ears, and represents a major advance in reproductive science? The world's first litter of puppies born by *in vitro* fertilization (IVF). The Baker Institute welcomed the pups into the world on July 10, 2015, an advancement that will help preserve endangered canid species and open new means for discovery in human and canine genetic disease.

"Right now about five species of wild dogs and wolves are threatened with extinction, and managing fragmented populations of these animals is going

to require more hands-on approaches," says Travis. "We're going to need technologies such as IVF to move genes around to maintain their genetic diversity and to improve the health of these species."

An accomplishment of Dr. Alex Travis and his students and colleagues, the births are the first time IVF, in which ova and sperm are brought together to create embryos and then implanted in a female, has been successfully accomplished in dogs, a feat scientists had previously been unable to accomplish despite decades of effort. The puppies' birth was a huge news item locally, nationally, and internationally, when it was announced in December.

Over a set of experiments, the team pinpointed the correct time after ovulation to collect mature eggs from female beagles, then combined them with either beagle or cocker spaniel sperm that had matured functionally *in vitro*. Once the resulting embryos had grown to the four-cell stage, they were frozen and stored until they could be transferred to a female hound when she was at the right stage of her cycle. The surrogate mother gave birth to seven healthy puppies (five beagles and two cocker spaniel-beagle mixes). Genetic testing indicated that the dog who carried the puppies to term was not the genetic mother, confirming the procedure had been completed successfully. The procedure is the culmination of many years of work in the Travis laboratory, as every step of harvesting oocytes and sperm, maturation, fertilization, freezing, storage, and transfer required testing and optimization.

All of the puppies were adopted by members of the scientific team. Travis himself adopted two beagles, who have kept the names Red and Green, names that hark back to the colors of the polish used on their nails to tell the newborn puppies apart.

ONLINE VIDEO ►



## Following up on the success of *in vitro* fertilization

*In vitro* fertilization opens doors to studying – and possibly preventing – genetic disorders in dogs and humans alike, and Travis and his team have been busy taking the research to this next step. He's applying what he learned from the successful *in vitro* work to test his ideas about how to eliminate genetic diseases in dogs, combining *in vitro* fertilization techniques with gene repair techniques to change the genetic material that is passed down from parents to offspring.

"The genetic differences that make each breed of dog unique can also predispose those breeds to specific diseases," says Travis, including certain forms of blindness, cancers, and others. "If scientists can identify what genes are responsible for a given condition, then coupled with new gene repair approaches, this technology gives us a way to actually fix that gene, and prevent illness rather than wait for the individual to get sick and then treat it." Many of these diseases are directly similar to conditions in humans, providing benefit to both pets and people.

To test whether this will work, Dr. Travis's lab is first attempting a proof-of-concept study with genes not related to disease, hoping to demonstrate that canine genes can be altered in very specific ways. He plans to report on this work in 2017.



## MEET OUR NEW DIRECTOR: LUIS M. SCHANG, MV, PHD

We're so very pleased to introduce the Institute's new Director, Dr. Luis M. Schang to you, our supporters.



Schang, formerly a professor of biochemistry and medical immunology at the University of Alberta, brings an international reputation in research to his new position at Cornell, and says he looks forward to helping the Institute continue to build upon its proud history of excellence in veterinary science and education.

"It took me five minutes at the interview to decide the Baker Institute is where I wanted to be," said Schang. "Also, I have been doing research for more than 25 years, and I can publish in journals, get patents, raise money, get grants, collaborate, and I can train people in the lab to be successful, but it's becoming a bit of a routine. I'm looking forward to new challenges, to having an impact on more people."

When he took on the role of Director of the Institute on September 1, 2016, Schang also assumed directorship of the Cornell Feline Health Center, an organization that provides cat health information to owners and veterinarians and funds research at Cornell's College of Veterinary Medicine.

"I come to develop a vision that we all agree upon and make happen."



Schang brings with him a dynamic research program focused on exploring the ways biologically active “small molecules” affect how viruses replicate.

“In my research, I look for molecules that have an impact on multiple viruses,” Schang says. “We use them as a way to test what the virus needs to replicate or what the virus does to cells.”

This research is productive on two levels: it answers fundamental questions about viruses at a detailed level, and it helps to usher potentially life-saving pharmaceuticals to market. Schang calls this research approach “discovery science” – a way of exploring scientific questions that delivers results that produce new knowledge and serve science, animals, and humanity in the near and long terms.

Schang brings this research philosophy to the Baker Institute, a veterinary research center with a track record of transformative discoveries, including breakthroughs in infectious disease and vaccines, reproduction and genetics. Schang says he will connect with the faculty, staff and trainees in the Baker Institute, the Feline Health Center, and the College of Veterinary Medicine to develop a vision for the future together.

“I don’t come to impose a vision; I come to develop a vision that we all agree upon and make happen,” Schang said.

He says at this point in the Institute’s development, when research funding has become extremely competitive and state support is uncertain, it’s important that a new director from outside the Institute sees challenges and opportunities with fresh eyes.

Like many current and former Baker Institute faculty members, Schang has a veterinary degree (MV, or Medico Veterinario, a veterinary degree granted in his native country, Argentina), which he sees as an asset in biomedical research.

“I want to be involved in training veterinary researchers,” he said. “Vets are perfectly trained in systems biology, and I want to do my part to help younger veterinary researchers to fully develop and reach their potential and bring out all that they have to offer.”

ONLINE VIDEO ►

## BICKNESE PRIZE WINNER TAKES THE FIGHT AGAINST CANCER PERSONALLY

As a PhD student in Dr. Scott Coonrod's laboratory, Bicknese Prize winner Dr. Sachi Horibata studied ways to stop mammary cancer cells from growing. Horibata defended her dissertation and graduated in May 2016, and today she's a postdoctoral research fellow at the National Institutes of Health's National Cancer Institute in Bethesda, Maryland.

For Horibata, the struggle against cancer is personal. She made the decision to go into cancer research after her beloved grandmother became ill with ovarian cancer while Horibata was in college. Sadly, her grandmother died from the disease, but Horibata renewed her resolve when a relative of another cancer patient thanked her for her diligent work after an undergraduate research symposium.

"That's when I realized how important research is to the advancement of treatment options for patients. That inspired me to continue my work in the field of oncology," says Horibata.

Today, she's studying drug resistance in cancer cells and looking toward a career in cancer research. She has used the Bicknese Prize funds to further her work at the National Cancer Institute by purchasing a dedicated laptop she can use at home to continue her research after hours and on weekends. The laptop was a necessity, she says, because security rules forbid her and other National Cancer Institute employees from handling confidential files on computers that are used for any other purpose. She also bought supplies to help complete her office at the National Cancer Institute, including software that helps her make professional-looking figures for her manuscripts and posters.

"The prize money was so nice," says Horibata. "As a graduate student your stipend is just enough for living, and the prize money made my professional life so much easier."



Dr. Joanne Bicknese, '76, DVM '78, established the Bicknese Family Prize in 2005 as an annual award to support research activities of a woman scientist-in-training. The award aims to provide funds at a critical point in the trainee's academic development and to help launch her into a successful career. The fund honors Dr. Bicknese's parents, Helen and Louis Bicknese, and her aunt and uncle, Grace and Carl Bicknese.



DR. JOANNE BICKNESE, '76, DVM '78 (LEFT)  
AND DR. SACHI HORIBATA, PHD '16 (RIGHT)

PHOTO BY RACHEL PHILIPSON

## ACTIVE GRANTS

Douglas F. Antczak, VMD, PhD

**Dorothy Havermeyer McConville Professor of Equine Medicine**

**Qatar National Research Fund, A Member of the Qatar Foundation**

Principal Investigator

*Comparative Animal Genomics in Qatar*

**Dorothy Russell Havemeyer Foundation, Inc.**

Principal Investigator

*Equine Histocompatibility Antigens*

**Morris Animal Foundation**

Principal Investigator

*Genetic studies of equine sarcoid tumors*

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Scott Coonrod, PhD

**Judy Wilpon Professor of Cancer Biology**

**University of Massachusetts**

Principal Investigator

*Identification of Citrullinated Biomarkers of Inflammatory Disease and Cancer*

---

Charles G. Danko, PhD

**Assistant Professor of Biomedical Sciences**

**Cornell University College of Veterinary Medicine Research Grants  
Program in Animal Health**

Principal Investigator

*Genetic Mapping of Canine Arvc in the English Bulldog*





Vicki Meyers-Wallen, VMD, PhD, DACT

**Associate Professor of Genetics and Reproduction**

**National Institute of Child Health and Human Development,  
National Institutes of Health**

Principal Investigator

*Identification of XX DSD Mutations by Rna-Seq and Comparative Genomics*

---

John S. L. Parker, BVMS, PhD

**Associate Professor of Virology**

**National Institute of Allergy and Infectious Disease,  
National Institutes of Health**

Principal Investigator

*Short Term Training of Students in the Health Professions*

**National Institute of Allergy and Infectious Disease,  
National Institutes of Health**

Principal Investigator

*Studies of the Global Translational Response to Human Virus infection*

**Office of the Director NIH**

Principal Investigator

*Graduate Training Program in Comparative Medicine*

**National Institute of Allergy and Infectious Disease,  
National Institutes of Health**

Principal Investigator

*Mechanisms of Virus-Mediated Compartmentalization of the Host  
Translational Machinery*

**Burroughs Wellcome Fund**

Principal Investigator

*BWF Becoming Faculty Workshop - Merit Conference/Leadership*

**Cornell Feline Health Center**

Principal Investigator

*Development of Feline Monoclonal Antibodies for Use as Therapeutic and  
Diagnostic Tools*

Colin R. Parrish, PhD

**John M. Olin Professor of Virology**

**National Institute of Allergy and Infectious Disease, National Institutes of Health**

Principal Investigator

*Structural Controls of Functional Receptor and Antibody Binding To Viral Capsids*

**National Cancer Institute, National Institutes of Health**

Principal Investigator

*Sialoglycan-Recognizing Probes for Defining Sialoglycomes in Biological Systems*

**National Institutes of Health DHHS**

Principal Investigator

*The Evolutionary and Biological Bases of Host Switching in Viruses*

**Mario Einaudi Center for International Studies**

Principal Investigator

*Collaborative international Studies of influenza Virus*

**The US-UK Fulbright Commission**

Principal Investigator

*Fulbright-Scotland Visiting Professorship At the University of Glasgow: Scotland*

*Visiting Professorship*

---

Elia Tait Wojno, PhD

**Assistant Professor of Microbiology and Immunology**

**National Institute of Allergy and Infectious Disease**

**National Institutes of Health**

Principal Investigator

*Prostaglandin Regulation of Type 2 Inflammation*

**Cornell University College of Veterinary Medicine**

**Research Grants Program in Animal Health**

Principal Investigator

*Immune Mechanisms of Allergic Inflammation in Dogs?*

---

Alexander J. Travis, VMD, PhD

**Associate Professor of Reproductive Biology**

**NY State Division of Science, Technology, and Innovation and the Centers for Advanced Technology**

Principal Investigator

*Use of Tethered Enzyme Technology to Diagnose Neural Injury*

**Atkinson Center for a Sustainable Future**

Principal Investigator

*Addressing the problem of infectious disease in endangered and threatened species*

---



Gerlinde Van de Walle, DVM, PhD  
**Assistant Professor of Viral Pathogenesis**

**Morris Animal Foundation**

Principal Investigator

*The Role of Citrullination In Canine Cancer Stem Cells: Opportunities For Novel Anti-Tumor Strategies And Biomarker Development*

**American Quarter Horse Association**

Principal Investigator

*The Equine Mesenchymal Stem Cell Secretome As A Potential Therapeutic For Neurologic Injury And Disease In Horses*

**Zweig Memorial Fund**

Principal Investigator

*Defining The Relationship Between Equine Herpesviruses And Development Of The Equine Gastric Ulcer Syndrome (Egus)*

**Cornell Feline Health Center**

Principal Investigator

*Towards Rationally-Based Treatments For Fhv-Induced Ocular Disease In Cats*

**USDA-Federal Formula Funds**

Principal Investigator

*The Bovine Mammary Stem Cell Secretome: A Novel Approach To Treat Mastitis*

**President's Council of Cornell Women**

Principal Investigator

*Establishment of Xenograft Models Of Mammary Cancer To Evaluate The Potential Of Epigenetic Drugs In Veterinary Oncology*

**President's Council of University Women**

Principal Investigator

*Regulation of immune responses during parasitic worm infection*



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Cape Ann Veterinary Hospital  
Easthampton Animal Hospital  
Linwood Animal Hospital  
Mattapoisett Animal Hospital  
Medway Animal Hospital



Meker Veterinary Clinic  
Norfolk County Veterinary Service  
Norwell Veterinary Hospital

## **MARYLAND**

Fallston Veterinary Clinic  
Flower Valley Veterinary Clinic  
Goshen Animal Clinic  
Layhill Animal Hospital  
Ruxton Animal Hospital

## **MAINE**

Down Maine Veterinary Clinic  
Windsor Veterinary Clinic

## **MICHIGAN**

The Kitty Clinic

## **NEW JERSEY**

American Animal Hospital  
Animal General  
Bryan Animal Hospital  
Eagle Rock Veterinary Hospital  
Essex Animal Hospital  
Harlingen Veterinary Clinic  
Larchmont Animal Hospital  
Marsh Hospital for Animals  
Matawan Animal Hospital  
Montvale Animal Hospital  
Mt. Holly Animal Hospital  
Oradell Animal Hospital  
Park Ridge Animal Hospital  
Ridgewood Veterinary Hospital  
Stafford Veterinary Hospital  
West Orange Animal Hospital

## **NEW YORK**

Adirondack Animal Hospital  
Animal Clinic of Mount Vernon

Animal General of East Norwich  
The Animal Hospitable  
Animal Hospital of Kent  
Animal Hospital of Niskayuna  
Animal Kind Veterinary Hospital  
Animal Medical of New City  
Ardda Animal Hospital  
Ardsley Veterinary Associates  
Atlantic Coast Veterinary Specialists  
Baldwin Animal Hospital & Bird Clinic  
Briarcliff Manor Animal Hospital  
Brook Farm Veterinary Center  
Central Animal Hospital  
Central Veterinary Hospital  
Clark Animal Care Center  
Clarkson Veterinary Hospital  
Cobleskill Veterinary Clinic  
Community Veterinary Hospital  
Corfu Darien Veterinary Clinic  
The Corinth Veterinary Clinic  
Crossroads Veterinary Clinic  
Deer Park Animal Hospital  
East Meadow Animal Hospital  
Eastview Veterinary Clinic  
Farmingville Animal Hospital  
Felton Veterinary Services  
Genesee Valley Equine Clinic  
German Flatts Veterinary Clinic  
Glen Animal Hospital  
Goosepond Animal Hospital  
Gracelane Kennels  
Great Neck Animal Hospital  
Greenpoint Veterinary Hospital  
Dr. Raymond S. Hayes  
Dr. William Henry Herbold III  
Highland Animal Hospital  
Hilton Veterinary Hospital  
Dr. Linda E. Jacobson  
Jeffersonville Animal Hospital

Lyndon Veterinary Clinic  
Manetto Hill Animal Clinic  
Manhasset Animal Hospital  
Manlius Veterinary Hospital  
Meadowridge Veterinary Hospital  
The Moriches Hospital for Animals  
Nanuet Animal Hospital  
North Castle Veterinary Hospital  
North Country Veterinary Services  
North Shore Veterinary Hospital  
Otterkill Animal Hospital  
Pleasant Plains Animal Hospital  
Pleasant Valley Animal Hospital  
Pleasantville Animal Hospital  
R. M. Stack Veterinary Hospital  
Ridge Animal Hospital  
Rivergate Veterinary Clinic  
Rondout Valley Veterinarian  
Rye Harrison Veterinary Hospital  
Saugerties Animal Hospital  
Dr. Barbara D. Scheffler  
Shirwill Trim Shop  
Sleepy Hollow Animal Hospital  
South Towne Veterinary Hospital  
Spring Hill Kennels  
Springville Animal Hospital  
Stack Hospital for Pets  
Steinway Court Veterinarian  
Stone Ridge Veterinary Clinic  
Storybook Farm Veterinary Hospital  
Sunrise Animal Hospital  
Tassel Hill Veterinary Clinic  
Dr. Alan M. Tausz  
Thorn Avenue Animal Hospital  
Three Village Veterinary Hospital  
Town and Country Hospital for Pets  
Turnpike Veterinary Clinic  
University Animal Hospital  
Veterinary Care of Ithaca

Veterinary Center of East Northport  
West Chelsea Veterinary Hospital  
Woodbury Animal Hospital  
Wright's Corners Animal Care Center

## **OHIO**

Veterinary Oncology and  
Referral Clinic

## **PENNSYLVANIA**

Cummings Veterinary Hospital  
Eagle Animal Hospital  
Manheim Pike Vet Hospital  
Milford Animal Hospital  
Thornwood Veterinary Hospital  
Titusville Veterinary Clinic

## **RHODE ISLAND**

Sakonnet Veterinary Hospital

## **SOUTH CAROLINA**

Creekside Veterinary Clinic

## **TEXAS**

Arlington South Veterinary Hospital

## **VIRGINIA**

Amherst Veterinary Hospital  
Central Virginia Veterinary Associates  
Godspeed Animal Care  
Lexington Animal Hospital  
Vienna Animal Hospital



## A GENEROUS BEQUEST FROM A DOG LOVER

When she passed away in 2014 at the age of 93, Ms. Janice K. Halliday bequeathed the bulk of her \$2 million estate to the Baker Institute in memory of her parents, J.W. and Elsie K. Halliday. A dog lover and lifelong resident of Essex, Connecticut, Ms. Halliday's bequest will be used to continue the research at the Institute she so ardently supported during her lifetime.

An annual contributor to the Institute in the late 1990s and early 2000s, Ms. Halliday was a long time employee of the Northeast Utilities System, which often matched her gifts.

Ms. Halliday was first introduced to the Institute by her late veterinarian Niel Pieper '32, who made a gift in memory of one of her beloved dogs. Dr. Pieper was, himself, a great supporter of the Institute and served on the Advisory Council from 1977 to 1993.

Like other nonprofits, the Baker Institute relies on financial support from donors to continue its work. By making a planned gift, you can significantly improve the Institute's ability to carry out cutting-edge research in animal health to improve the lives of animals and the humans who love them.

If you are interested in learning more about planned giving, please contact Cornell's Office of Gift Planning at 1.800.481.1865, by email at [gift\\_planning@cornell.edu](mailto:gift_planning@cornell.edu) or online at [alumni.cornell.giftplans.org](http://alumni.cornell.giftplans.org).



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July 1, 2015 through  
June 30, 2016

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Ms. Janice K. Halliday\*

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Mrs. Mary Jane Engman

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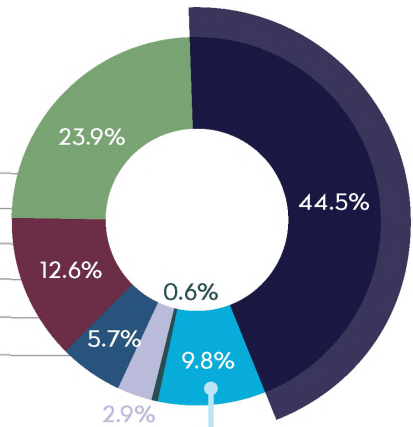
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# 2016 FINANCIALS

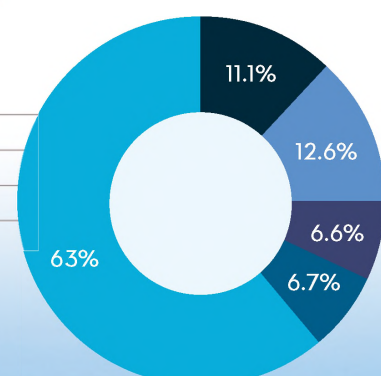
## REVENUES TOTAL: \$7,953,274

Endowment Income
Grants & Contracts
Bequest
Gifts
Vet College Support
Interdepartment Revenue
Other Sources



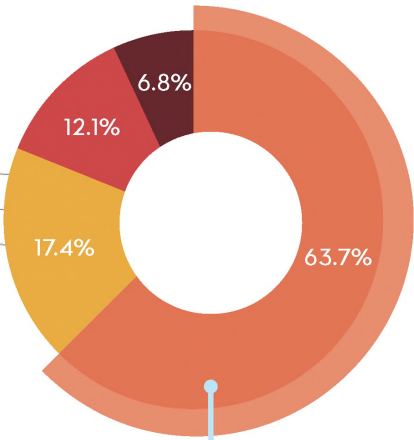
## GIFT DETAILS TOTAL: \$777,338

\$0-\$100	Total: \$85,936
\$101-500	Total: \$98,318
\$501-1,000	Total: \$51,470
\$1,001-5,000	Total: \$51,863
Over \$5,000	Total: \$489,752



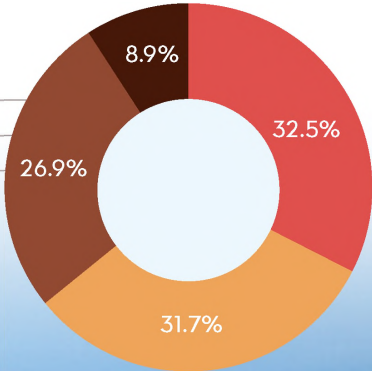
EXPENSES  
TOTAL: \$8,056,133

- Research Support
- College Support and Services
- Infrastructure
- Administration



RESEARCH SUPPORT DETAILS  
TOTAL: \$5,128,063

- External Sponsored Research
- Faculty Support
- Internal Research Support
- Graduate Student Support











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## OUR VISION

A healthier future for the animals that so faithfully  
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## OUR GOAL

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