

BAKER INSTITUTE FOR ANIMAL HEALTH



CREATING
A BETTER
FUTURE
TOGETHER

2015 ANNUAL REPORT

Research
Collaborations

Faculty
Profiles

Award
Winners

Honor Roll
of Donors



CREATING A BETTER FUTURE TOGETHER

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Dear Friends,

It is a pleasure to once again update you on the accomplishments of the Baker Institute for Animal Health, and to share the promise of the coming years. We are excited and encouraged by the work of our outstanding faculty, staff, and students. In collaboration with you, our supporters, we feel confident that the only thing that will eclipse our successful past is the promise that our work holds for the future benefit of animal health.

Collaboration is at the core of meaningful scientific inquiry. By bringing together groups of people with varied expertise, we compound their contributions and provide the greatest opportunity to solve the scientific problems that face our world today. This is certainly true of many important issues in animal health, and as you can see in reviewing this year's Annual Report, we understand the importance of working together to achieve our goals of developing new approaches for diagnosing, treating, and preventing diseases in animals.

We also understand the vital role our partnership with you, our supporters, plays in our successful programs, and we are always looking for new ways to engage our donors. By combining the dedication of our supporters and the unique individual and collective scientific expertise of our faculty, we are achieving great improvements in the well-being of our animal friends. We look forward to the future and are excited about what we can achieve together.

Thank you for your continued contributions to this unique collaboration.

Sincerely,

Colin R. Parrish, PhD
Director, Baker Institute for Animal Health

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DANKO +

TAIT WOJNO



Working together to solve the puzzle of allergies

The sneezing, scratching, and inflamed skin that come from different types of allergies are all too common problems for dogs and cats. According to one rough estimate, allergies account for 25 percent of visits to the veterinarian. However, there are few specific, effective, and side-effect free treatments available that can help dogs and cats suffering from allergies to dust, mites, and pollen. At the Baker Institute, two faculty members are bridging the disciplines of immunology, genomics, and computational biology in order to better understand why the immune system launches the dysfunctional attacks that make these desperate difficulties for dogs and cats. Their research has the potential to make profound new discoveries about allergies and could help design treatments to help pets and humans suffering from their bodies' own immune systems.

"The immune system is a doubled-edged sword," says the Institute's newest faculty member, Dr. Elia Tait Wojno, who studies immunity and immune disorders. When it's working correctly, the immune system attacks invading bacteria, viruses, and fungi to protect an animal or person from infectious diseases. However, in the case of allergic diseases, the immune system mistakenly launches an attack against harmless substances, like pollen or certain foods, which actually hurts the body.

To help figure out why things go haywire, Tait Wojno has partnered with another Institute faculty member, Dr. Charles Danko. An expert in deciphering how cellular programs are written into the DNA sequences of species, Danko studies how these programs are affected by environmental factors like allergens. He has pioneered powerful new ways to tease apart complex cellular systems like the immune system.

Tait Wojno and her research team are comparing the immune response in animals that have allergic disease with the immune system of animals that do not have allergies. This comparison will allow them to see how the immune system changes during allergic disease, which could help to explain what goes wrong when the body launches an allergic response. In particular, Tait Wojno and her team are focusing on rare immune cells that contribute to allergic disease. Tait Wojno says that although they make up just a tiny part of the immune system, these cells are extremely important players in allergic diseases, so she's isolating them and handing them over to Danko for further analysis.

For his part, Danko and his team will analyze individual cells using bioinformatics techniques to identify which genes are turned on and off during the development of allergic disease. It's an exciting new capability for immune research, says Danko, and the potential for new discoveries is great. "We're going to survey all the genes currently in use by the cell," says Danko. "Looking at the cellular system holistically will allow us to understand how the different genes work together during the process of allergic disease." Danko says they're hoping to find inflammation pathways that no one had ever considered or known about before.

"This is an exciting opportunity to apply what I know to a problem and also apply new genetic approaches to learn unexpected things about the immune system," says Tait Wojno.

For now, Danko and Tait Wojno are applying for grants to help carry the research to the next level. If you would like to help support this project or any of the other work at the Baker Institute with a donation, please contact the Office of Alumni Affairs and Development: 607.253.3745 or vetfriends@cornell.edu.

Once the techniques are perfected, Tait Wojno and Danko plan to study blood samples from dogs who visit the Cornell University Hospital for Animals for allergy treatment. Veterinarians near and far refer their patients, including dogs suffering from allergies that haven't responded to treatment, to Cornell. Ultimately, Tait Wojno and Danko hope to help dogs, cats, and humans that suffer from allergies by providing new information on how and why allergic disease occurs, which will help to inform the development of targeted new treatments.

Partnering with diagnostic center and veterinarians to help horses suffering from a common tumor

Sarcoid tumors in horses come in a variety of forms, sometimes appearing as flat, hairless patches, other times developing as small raised nodules, but in severe cases, sarcoids are lumpy, invasive masses of flesh that regrow as soon as they are surgically removed, often putting the horse's life in danger. Some horses are more susceptible to these severe forms than others, and Dr. Doug Antczak is trying to figure out why.

"Sarcoids often occur under the areas where the tack touches the horse, under the girth or where the bridle touches the head," says Antczak. Bovine papilloma virus (BPV) has been identified as the cause of sarcoids, and it's thought that rubbing on these areas causes irritation that opens the horse to infection with the virus. Antczak thinks it's possible that genetics can explain why some horses get only mild symptoms of infection while other horses are afflicted with tumors that threaten their lives.

"Usually an owner can just leave the tumor alone if it's not bothering the horse," says Dr. Doug Antczak, who is an expert in the horse immune system. "But in a small fraction of cases sarcoids grow very large. Many are refractory to treatment, so if you surgically remove them, or burn or freeze the tumors, or treat them with radiation therapy or immune stimulants, they still grow back. And sometimes the tumors spread to many parts of the body."

Thanks to a partnership with Cornell's Animal Health Diagnostic Center, Antczak and his team have received 300 sarcoid biopsy samples from veterinarians all over the Northeast who have turned to Cornell for help in treating their most serious cases. Antczak's team is comparing the genes of horses with the most severe forms with control horses to identify whether genetics can explain why some horses and breeds are more susceptible than others.

They've identified small variations in two regions on the horse genome that are common to many of the horses with sarcoids. Their early results indicate one of these variations, which is located on chromosome 22, may be correlated with the most severe forms of the disease, and the team is currently working to get more biopsy samples from severe sarcoids to confirm the link.

If they're correct, and the region on chromosome 22 is different in horses that are more susceptible, then there may be a way to test horses for this vulnerability or devise treatments that help to overcome it.

For his part, Antczak is anxious to help alleviate horses struggling with the condition. "Sarcoid is the most common tumor of the horse," says Antczak. "This project has the potential to change the way sarcoids are diagnosed and treated, and that would be an important advance in equine medicine."

ANTCZAK +

VETERINARIANS



VAN DE WALLE

+ COONROD

Joining forces against mammary cancer

Mammary cancer strikes both humans and animals, but once the tumors are surgically removed, there are few specific drugs available to prevent the cancer from coming back. Two faculty members at the Baker Institute have joined forces to test a new therapy for treating this common form of cancer in pets and humans alike. The early results are promising and the drug may be headed to clinical trials in animals soon.

Known as breast cancer in humans and mammary cancer in animals, these cancers are common regardless of the name. At a cellular level, mammary tumors in dogs and cats are very similar to human breast cancer tumors, and they may occur in pets even more often than they do in humans: unspayed dogs can have as high as a 26 percent chance of developing mammary cancer and the disease represents the third most common cancer in cats.

For years, Dr. Scott Coonrod has worked to identify targets in breast cancer cells that could be attacked with specific drugs. PAD enzymes present one such target. A type of bioactive molecule that plays a role in estrogen signaling, PAD enzymes control an important messaging system in many breast cancer cells. Coonrod's collaborator at the University of Massachusetts, Dr. Paul Thompson, developed a series of inhibitors that block the action of these enzymes in the hopes they might stop breast cancer cells from dividing and growing. Coonrod and his team tested the potential drugs in cultures of human tumor cells and in mice with mammary cancer. The results for one particular PAD inhibitor, BBCLA were exciting, Coonrod says.

"In cell culture the inhibitor prevents the growth of breast cancer cells but doesn't affect the growth of normal cells, and in mice it suppresses tumor growth and is well-tolerated," says Coonrod. This ability to specifically target cancer cells is a crucial feature for drug development, since drugs that leave normal cells alone might cause fewer side effects.

These early results in human cells and mice made Coonrod wonder about how it might work for dogs and cats, so he turned to fellow Institute faculty member Dr. Gerlinde Van de Walle for help.

Using her expertise in growing canine and feline cells, Van de Walle and her team tested BBCLA on normal dog and cat mammary cells and in cultures of mammary cell tumor cells from both species. Again, the compound inhibited tumor growth but left the healthy cells unharmed.

"At realistic concentrations the compound is capable of killing tumor cells in cell culture assays," says Van de Walle.

Now that the candidate drug has cleared these hurdles, Van de Walle and Coonrod hope to carry out pharmacology studies to ensure it's safe for use in animals. After that step comes clinical trials, which will require forming a region-wide network of veterinarians and enrolling dogs and cats that have mammary tumors in a study to test how effective the drug is in real-world circumstances.

"We're actively pursuing funding to take the research to the next level," says Coonrod.



From the bench to the boardroom: Judy Appleton takes on role as Vice Provost

Judy Appleton is gaining a lot in her move to a position in administration, but she's already nostalgic for the moments of discovery that only science can offer.

"The most exciting times in the lab were when someone would come to me and say 'I don't understand what's happening here.' Those moments of discovery? That I will really miss," says Appleton.

After more than 30 years as a faculty member and postdoctoral scientist at the Institute, Appleton is transitioning to a full-time role as Vice Provost. For two years, Appleton has carried on in her role at the Baker Institute in addition to her administrative position, a role in which she represents the University in its dealings with the State University of New York (SUNY) and the state government and leads the Engaged Cornell initiative, a program launched with a \$50 million gift in 2015 to encourage community engagement and real-world learning experiences among all Cornell undergraduate students.

Her office is now at the administrative center of the University, but Judy Appleton's Cornell research career began and ended with worms. From the time she started as a postdoctoral scientist in 1982 and earned a faculty position in 1987, Appleton focused her research on the immune response to parasites, a complex interaction that has evolved to a sort of stalemate in most animals and humans. Although rare in humans in this country thanks to public health measures and infrastructure, parasitic diseases are still common in other parts of the world, and they're very common in pets, livestock, and wildlife everywhere.

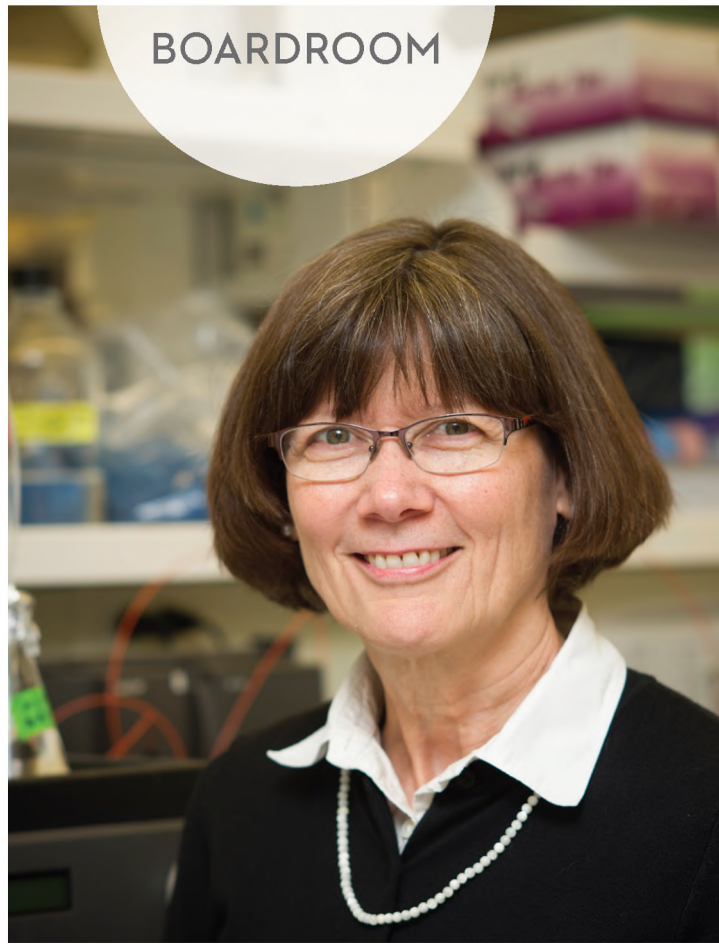
With their focus on immune system interactions with parasites, Appleton and her group were able to make a number of discoveries that contributed to the development of new ways of preventing and treating parasitic infections. Appleton's lab, for instance, was the first to uncover the unexpected fact that immune system components called eosinophils can actually make it easier for parasitic worms to maintain an infection.

"Dogma said that eosinophils defended the body against worms, but we found that they actually helped the worms," says Appleton. The discovery changed the way many scientists and drug developers saw the immune system's role in parasitic infections.

Although Appleton says she's pleased to be focusing on only one job now, she will miss her time at the Institute mentoring students and collaborating with fellow scientists close to home and around the world.

"I miss lab meetings especially, because it was so exciting to discuss and analyze data from the experiments that the students, technicians, and post-docs were doing," says Appleton. "I miss seeing my colleagues at the Institute. It was my privilege to work with so many talented people."

BENCH TO BOARDROOM



Canine Influenza

WHAT IS IT?

H3N8 virus

History:

H3N8 has circulated in North America since 2000 when a strain of influenza in horses spread to dogs.

Locations:

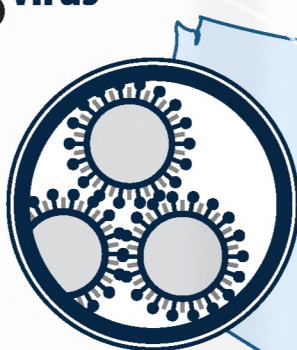
H3N8 is now mostly limited to dogs in animal shelters.

Vaccines:

There is a vaccine available for H3N8.

Infects:

H3N8 Only infects dogs.



H3N2 virus

History:

H3N2 was first found in the U.S. in 2015. It was introduced to the U.S. from Asia, where it probably came from an avian influenza virus that spread to dogs.

Locations:

In the U.S., H3N2 has circulated among household dogs.

Vaccines:

There is no H3N2 vaccine yet. (The H3N8 vaccine is probably not effective in preventing infection with H3N2).

Infects:

H3N2 infects dogs and sometimes cats.

NEW!

Neither strain of canine influenza infects humans.

The Influenza Timeline

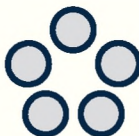
Exposure to the Virus

DAY 1



Symptoms Appear

DAYS 2 - 4



Symptoms Diminish After

DAY 5 +



Infectious Period

Dogs appear to shed significant amounts of virus for **1 to 4 days** after they initially become infected.

Know the Symptoms:



COUGHING



SNEEZING



LETHARGY



FEVER



DISCHARGE
FROM NOSE OR EYES

How Bad is it?

Most infected dogs will only experience a mild upper respiratory tract illness, and recover within a few days. Dogs with more severe cases of influenza are often suffering from additional viral or bacterial infections. Influenza appears to be fatal for **less than 1 or 2%** of dogs that become ill.

If you think your dog might have the flu **call your vet** and describe your concerns. If your dog is infected with influenza stay away from places where he or she can infect other animals. **Voluntary quarantine for 5-7 days** may help slow the spread of the virus.



What Should You Do?



Diagnosis: The signs of canine flu are useful in diagnosing the disease. Testing may be available through your veterinarian, and may involve sending a nasal or throat swab, or blood samples to a diagnostic laboratory.

LEARN MORE AT WWW.VET.CORNELL.EDU/BAKER



Cornell University
College of Veterinary Medicine

The Animal Health Diagnostic Center (AHDC) seeks to improve the health of food and fiber producing animals, companion animals, sport and recreational animals, exotic animals, and wildlife by offering state of the art diagnostic services for veterinary diseases and by identifying emerging veterinary infectious diseases.

The Baker Institute for Animal Health is dedicated to carrying out basic research in animal health. Visit our website to learn more about our studies and how you can support our mission. We are a proud part of Cornell University's College of Veterinary Medicine.

Baker Institute for Animal Health
College of Veterinary Medicine
Cornell University
235 Hungerford Hill Road
Ithaca, NY 14853
(607) 255-5600
BakerInstitute@cornell.edu

New infographics help pet owners and our partner veterinary practices

Pet owners often turn to their veterinarians for health information, and the Baker Institute for Animal Health is helping our partner clinics provide accurate, up-to-date information their clients need with a new series of infographics and fact sheets for clinics participating in our Clinic Memorial Program. The infographics and fact sheets are a small token of our gratitude for the veterinarians who help animals every day in their practice and through their support of our research.

It is never easy when a pet passes away, but it helps when a veterinarian expresses condolences for their client in a way that offers meaningful comfort. Veterinarians who participate in our Clinic Memorial Program can make a gift to the Baker Institute for Animal Health in memory of a client's lost pet as a way of offering solace to their clients while also extending the promise of a better future for animals by supporting the Institute's work to improve the diagnosis, treatment, and prevention of cancer, infectious disease, genetic disorders, and other illnesses. Participating in the Clinic Memorial Program couldn't be easier. Once a veterinary practice provides us with gift and contact information through our easy to use online giving portal, we'll send your client a letter informing them of your kindness.

Our new infographics program began with the headline-making outbreak of canine influenza. Here at the Baker Institute, we're working hard to find answers to important questions regarding the H3N2 influenza outbreak and ways to treat and prevent this emerging disease. Dr. Colin Parrish and his team are studying the H3N2 canine influenza virus, investigating how the canine immune system reacts to it, and working with researchers at other institutions to create models of how the virus passes from dog to dog.

We have also created an electronic version of the canine influenza infographic that anyone can share via email, on a clinic website, or via social media. Visit our website to download a copy of the infographic and fact sheets: www.vet.cornell.edu/Baker/News/CanineInfluenzaUpdates.cfm

Veterinarians, we'd like to hear from you! If there are subjects relevant to your clients that you would like to see covered in an infographic, please contact our Communications department: 607.256.5600 or bakerinstitute@cornell.edu.



Clinic Memorial Program participant says giving is a win-win

Clinic Memorial Program participant W. Bradley (Brad) Davis DVM '83 says the donations his practice has made in honor of his client's lost companions have helped cement his relationships with his clients.

"In my experience over 30 years of being a vet, there are no downsides to this program," says Davis.

"As veterinarians, we have a responsibility to support the science that built our profession and our livelihood, but donations are also a good business decision. The end of life is a very important time to maintain that relationship, and anything you can do to help someone during that time of grieving is a huge service. It's the right thing to do," says Davis.

Davis says grieving clients at his practice, Davis Companion Animal Hospital in Woodbury, Connecticut, are extremely grateful for the gesture of a memorial gift to the Baker Institute, and he receives many thank you letters afterward. The gesture often creates a lasting bond, according to Davis. People who have mourned the loss of a pet can feel reluctant to return to a practice they associate with sad times, but Davis says in his experience, a memorial gift can turn those unhappy memories into gratitude and a long-term relationship with his clients.

"It's an effective way to soften the blow a little bit and decrease the negative association clients may have with our practice," Davis says.

"Even years afterward, owners often remember the memorial contribution and bring their new pet back to the clinic that made a thoughtful and comforting gesture," says Davis.



2015 BICKNESE PRIZE

ZHENGCHUN LU - BICKNESE PRIZE

Bicknese Prize winner studying why “cat flu” strikes some cats harder than others

Bicknese Prize winner Dr. Zhengchun Lu is tracking down a selective killer. Feline calicivirus periodically spreads like wildfire in animal shelters, moving most quickly among cats housed in close quarters, but the virus makes some cats quite ill while apparently skipping over others. Lu is using her award funds to discover why some cats develop severe respiratory infections from calicivirus while others get off scott-free.

“Calicivirus is a very, very common cause of upper respiratory tract infections in cats. It causes flu-like symptoms, so people call it ‘cat flu,’” said Lu. Cat flu can actually be brought on by any of several different viruses, she says, but calicivirus is the most common cause.

During her time as a postdoctoral associate in Dr. John S. L. Parker’s laboratory, Lu has been studying whether genetic differences between cats can explain why calicivirus can infect some cats but not others. Using blood samples from 140 different cats, Lu looked for differences in a protein that cats produce on the outsides of cells in their lungs, airways, and elsewhere in the body that calicivirus attaches to. She found two genetic variations that seem to make cats resistant to infection by calicivirus – a finding that could help find ways to treat or prevent calicivirus infection in susceptible cats.

Lu has used her Bicknese Prize funds to purchase a laptop for her research and to support her travel to the Annual Meeting of the American Society for Virology in London, Canada, in July 2015, where she was invited to present a talk about the genetic variations that affect calicivirus infections. It’s an opportunity she might not have been able to take advantage of without the prize money.

“I’m really grateful for the opportunity the prize presented to me. The conference was a great opportunity to talk about my science with world-class virologists and have my name recognized, which is a huge benefit for my future research collaboration and career development,” says Lu.



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.



2014 FOUNDERS' AWARD

JOSEPH KINNARNEY - FOUNDERS' AWARD

Joseph Kinnarney DVM '80 learned of the Baker Institute during his time as a veterinary student at Cornell, when Institute scientists were developing the first vaccine for canine parvovirus in the midst of a global pandemic of that disease. Kinnarney's respect for the Institute grew as he began his career practicing mixed-animal medicine, and in 2000 he enthusiastically accepted former Institute Director Doug Antczak's invitation to join the Advisory Council.

"One of the highlights of what I do is being able to be involved with the Institute. It's not just the Council members that are amazing and wonderful to be around, but all the smart, bright research that's taking place. What you get, and what you hear from these people is unbelievable," Kinnarney says.

Kinnarney is putting his commitment to improving the quality of veterinary care into practice in his current position as president of the American Veterinary Medical Association (AVMA). Kinnarney has stated that focusing on economic issues facing the veterinary profession and communicating with the public about the important roles veterinarians play in society are two of his major focal points for his term as AVMA president.

"Veterinarians from all walks of professional life, whether they work in companion animal medicine, food animal medicine, public health, food safety, biosecurity or research, bring much value to the American public," Kinnarney said. "There has never been a time in the history of the world that we have had so much knowledge and skill. We must use this knowledge and skill to grow all services of veterinary medicine to ensure both animal and human health."

For his contributions to the Institute and to his profession, The Baker Institute has awarded Kinnarney the Founders' Award. Created in 1990, the Founders' Award is a tribute to the many veterinarians, dog owners, and kennel clubs who contributed to the establishment of the Cornell Research Laboratory for Diseases of Dogs, later re-named the Baker Institute for Animal Health. The award is given to a veterinarian whose contributions to the Institute and to their profession exemplify our founders' commitment to the advancement of veterinary medicine.

"I was shocked to receive the award. When Colin [Parrish] called me, I thought 'you've gotta be kidding me'. It was humbling and I am so appreciative."

"In my role as AVMA president and working with the Baker Institute, I've realized the public does not totally comprehend the value of what we as veterinarians, both practitioners and researchers, do for human health. I'm hoping as we move forward, we can make sure we can inform the public of the great things Baker has done. The parvovirus vaccine is just one of them. We've enhanced human and animal lives," Kinnarney said.

Growing up outside of Boston, Kinnarney has always had a passion for riding and showing horses. Currently a North Carolina resident, he shares his home with his partner Bradley Marlow, as well as several cats and dogs. He has two grown sons, Joseph William and Jeffrey Patrick, and three grandchildren.

After her passing in 2010, Barbara Herndon, a longtime supporter of the Institute and of the College of Veterinary Medicine, granted the Baker Institute for Animal Health a generous bequest. Herndon was introduced to the Institute by her trusted friend Dr. John W. Whitefield, a 1965 graduate of Cornell's College of Veterinary Medicine. Whitefield helped to manage the orthopedic care for Bryna, Mrs. Herndon's Welsh Springer Spaniel, and he also made memorial gifts to the Institute when Herndon's canine companions passed away. Inspired by the Institute's discoveries to benefit animal health, Herndon's wish was that her gift be used to support research that benefits the health and well-being of dogs.

A WOMAN'S LOVE FOR DOGS HELPS TURN A VISION INTO A REALITY

Barbara Herndon's generosity is making it possible to support research on dog diseases in the Institute, and to launch the Cornell Canine Health Center, a network of faculty and staff conducting studies and delivering information to owners and veterinarians in order to improve the health of dogs. With an estimated 70 million dogs living in the United States and millions more in countries all over the globe, the Center will strive to become a key resource for owners and veterinarians seeking up-to-date canine health and behavior information.

"This generous gift was a great surprise. We know how passionate people are about their dogs and will honor Mrs. Herndon's legacy by dedicating her support exclusively to improving the health of dogs, both domestically and internationally," explains Dr. Colin Parrish, Director of the Baker Institute.

For many friends of the Institute, a charitable bequest is a meaningful way to support our mission of conducting research to make foundational new discoveries about animal health and disease. You can name the Institute as the beneficiary of a portion of your estate in your will or other estate plans. Research shows that more than 80 percent of Americans contribute to nonprofit organizations throughout their lifetime but that fewer than 10 percent choose to continue this support through a charitable bequest.

Bequests to the Institute offer many benefits and are in most cases exempt from federal estate taxes.

Like other nonprofits, the 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.

The Institute is grateful to all its supporters and we are pleased to be able to help fulfill Barbara Herndon's legacy through our research and efforts for the Cornell Canine Health Center. If you are interested in learning more about planned giving, please contact Cornell's Office of Gift Planning at 1.800.481.1865.







NEW ADVISORY COUNCIL MEMBER



A long-standing animal lover, new Advisory Council member Colonel Gayle Watkins, MBA, PhD had known and respected the Baker Institute long before accepting the offer to join the council.

"I've been a fan of the veterinary profession from a young age and knew of some of the Institute's early work, particularly having to do with the parvovirus. I was born with a love for animals – I was collecting creatures since I could walk and crawl. Around the age of eight, I fell in love with horses and started riding," says Watkins.

After graduating from Gettysburg College, Watkins joined ROTC to earn money to go to veterinary school. She met her future husband, Andy Chmar, a land conservationist and former army officer, through ROTC. Contrary to her original plan, Watkins ended up staying in the Army for 22 years, where she earned the rank of Colonel, earned her PhD at Stanford University, and became a tenured faculty member at West Point, where she taught leadership and oversaw the management program. Throughout her career with the Army, Watkins's passion and love for animals persisted and she bred and showed dogs throughout the United States, Canada, and Europe.

"I'm thrilled to have the opportunity to find a way to contribute. There aren't a lot of dog breeders on the Council so there's a way for me to be an intermediary, between breeders and owners and the Institute. I hope that's a role I can play and maybe provide insights or actions that can bring more dog owners to Baker or vice versa," says Watkins.

Since retiring from the Army, Watkins has launched a new venture, Avidog International LLC, a business focused on inspiring and empowering dog breeders and puppy owners to raise confident, athletic, and healthy puppies. Originally from San Francisco, California, Watkins currently resides in Cold Spring, New York with her husband Andy, an executive director of a local land trust, their three adult golden retrievers, varying numbers of puppies, and eight silly chickens.

"I'm very excited about the opportunity to get to know and support the researchers. Genetics and virology are very exciting topics to me and I want to help in getting the word out more broadly about the Baker Institute. The Institute puts out some incredibly useful and practical information which is really grounded in science and is something dog owners need more access to. I love the work the Baker Institute does!" she says.

Laboratory technician Lucy Gagliardo has always had a keen interest in natural science. As a child, she would lose herself for hours drawing animals and plants. Deciding to pursue a career in science, Gagliardo graduated with a Bachelor of Science Degree in Biology from Southampton College and began work at the College of Veterinary Medicine in January 1983. She accepted a position working for Judy Appleton at the Baker Institute in 1986, and was with the Institute until she retired in July 2015.

Gagliardo says her colleagues are what she loves most about the work.

"The people at the Institute are wonderful. It feels like a family. Everyone is very caring and helpful and I always felt free to go to any lab for help. No matter how busy they are, everyone is there for each other in all aspects," she says.

Gagliardo began her work with Appleton on a project focused on the horse immune response to equine influenza vaccines and the development of monoclonal antibodies against flu strains. Gagliardo later transitioned to the other major focus of the Appleton lab – studying mucosal immunity using the intestinal parasite *Trichinella spiralis*.

As the Lab Manager in the Appleton laboratory, Gagliardo helped train new members on the basic techniques and protocols of the lab and ensured that all supplies remained properly stocked. Gagliardo estimates that she has trained over twenty five students and visiting professors over the years.

"I loved the diversity of my job, it was never routine. There was always something new and different to do and I was able to learn so many different techniques," Gagliardo says.

Since her retirement Gagliardo has filled her days with traveling and drawing. She hopes to improve her teaching skills so she can offer an enrichment program to camps and schools to help introduce children to natural science illustration. She also plans on fulfilling her dream of hiking at Machu Picchu. Having recently celebrated her bunny Fizz's eighth birthday this past October, Gagliardo looks forward to seeing more of her son Daniel as he completes his Master's Degree in Biological and Environmental Engineering from Cornell University.

LONG-TERM STAFF HIGHLIGHT: LUCY GAGLIARDO





JAMES EAGLESHAM '15

Baker Institute student making scientific connections around the world

Cornell, Cambridge University, Harvard. James Eaglesham '15 is at the threshold of what may be an impressive career in virology, and he got his start as an undergraduate researcher at the Baker Institute. With the support of his adviser, Dr. John S. L. Parker, Eaglesham participated in cutting-edge research on the effects of viruses on the body, was awarded a prestigious fellowship to study at Cambridge University, and secured a spot at one of the top virology graduate programs in the country.

"In Dr. Parker's lab I got to use a fancy new technique called ribosome profiling," says Eaglesham, who worked with Dr. Saisai Wei, a postdoctoral scientist in the lab. "I examined which genes are turned on and expressed when cells are infected with reovirus." The results will help determine how the immune system responds to viral infection – an important interaction that can mean the difference between health and disease.

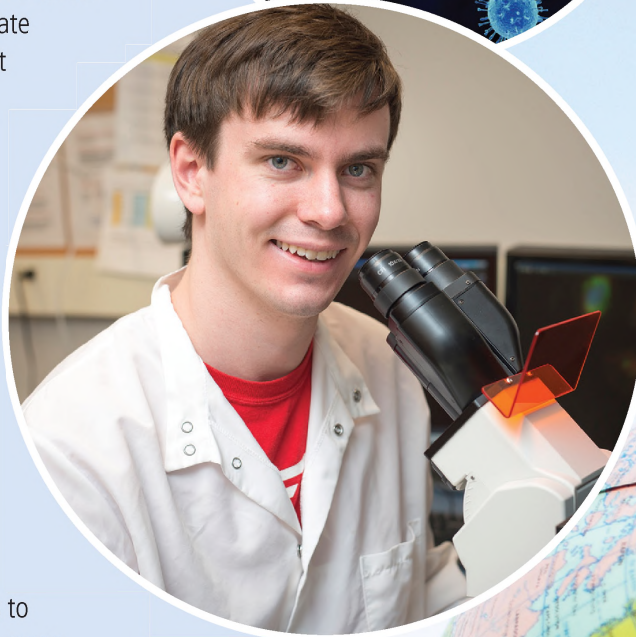
The fellowship makes for a busy year for Eaglesham, who was born and raised in Ithaca. He graduated in May 2015, and he's spending the 2015-2016 academic school year at Cambridge University, where he'll be conducting research in the lab of Professor Ian Goodfellow to earn his Masters of Philosophy (MPhil) in Pathology. He'll be working on treatments for norovirus, a gastrointestinal infection that is perhaps most well-known for causing widespread outbreaks aboard large cruise ships.

"There's a lack of available therapies for norovirus," says Eaglesham. "No vaccine, no good antiviral. The idea of the project is to use a combination of two drugs to find a synergy that will be an effective treatment for the virus." They'll test the treatments in cell cultures, then eventually move on to mice, who can be afflicted with a virus closely related to human norovirus.

When Eaglesham returns to the States in fall 2016, he'll begin his PhD studies at Harvard University, which offers a diverse array of different sub-specialties in virology to explore.

Having lived in Ithaca his whole life, Eaglesham is excited to get to know Cambridge, England and Cambridge, Massachusetts, but he says he's going to miss working at the Baker Institute.

"The Institute is an excellent community, and everyone is engaged and friendly," he says. "It was really easy to get to know everybody."





SARAH DUMAS DVM '12

Graduate student working with partners on two continents to help kids, wildlife

Sarah Dumas DVM '12 is making a difference for people, animals, and ecosystems in Africa. For her graduate project, Dumas is establishing chicken egg laying facilities in rural parts of Zambia, a novel program aimed at improving the nutrition of small children and families that may also decrease villagers' reliance on poaching and on burning fields for hunting.

But for Dumas, it's all about the kids.

"In Zambia, I can't think of any single issue that's more important than childhood nutrition," because of the long term impacts of nutrition on growth and a person's ability to contribute to their household and community. "It's the basis of a community's ability to develop. With my veterinary degree and my interest in public health, I feel that increasing the availability of animal-sourced foods is my niche."

Dumas began her work in Zambia as a veterinary student in 2009, building on the work of other students participating in the Expanding Horizons program, in which Cornell veterinary students pursue career-related experiences in developing nations. She's working with her faculty advisor, Dr. Alex Travis, as well as Dr. Sera Young and Dr. Rebecca Stoltzfus in the Division of Nutritional Sciences, and the organization Community Markets for Conservation (COMACO), to set up community-owned egg laying facilities at twenty locations in Zambia's Luangwa Valley. The results of a pilot program in which Dumas helped communities create three egg production facilities doubled the egg consumption in surrounding households and increased the incomes of the egg producers by 44 percent.

"The focus of my PhD project is taking that pilot one step further and creating a system for rural livestock production that can be economically and environmentally self-sustaining and can be replicated throughout Zambia to increase the availability of animal-sourced foods in poor rural communities," says Dumas. She and her colleagues will compare communities with egg layer facilities against control communities to identify whether the programs increase the consumption of eggs by women and children, improve overall diet quality, and enhance child growth. They also plan to ensure the facilities are profitable for the four to five individuals who own and run each one, 80 percent of whom are women.

If it works, the program to make eggs more available to communities in the Luangwa Valley could be good news for wild animals, too, since families will no longer have to rely as heavily on poaching to get by. In Dumas' opinion, laws against poaching will only work if locals have other options for feeding their families.

"Poaching laws in the absence of some sort of food alternative could hurt children," says Dumas. "This is my attempt to provide that alternative." Dumas and Travis are actively seeking additional funding to complete a substudy of the impact the project may have on bushmeat consumption.

More available food could also bring an end to another common practice in the area: children will often burn fields and meadows to expose mouse nests, which they then dig up to gather rodents for cooking and eating at home. Dumas hopes that by providing a reliable and sustainable source of animal-based food to these villages, children will no longer have to put themselves and their surrounding ecosystems at risk with this dangerous practice.

"The idea is to increase household incomes, pull families out of poverty, and decrease their reliance on nonrenewable natural resources," Dumas says.

After graduating with her PhD, Dumas has her eyes on a job at a non-governmental organization like CARE or Heifer International to carry out and evaluate projects that help improve the lives of people in developing nations.



ACTIVE
AWARDS

Sources of outside research funding for Baker Institute faculty members in fiscal year 2015 (July 1, 2014 through June 30, 2015)

Douglas F. Antczak, VMD, PhD, Dorothy Havermeyer McConville Professor of Equine Medicine

Morris Animal Foundation, *Genetic Studies of Equine Sarcoid Tumors*, Principal Investigator

Qatar Foundation-Qatar University, *Comparative Animal Genomics in Qatar*, Principal Investigator

Scott A. Coonrod, PhD, Judy Wilpon Associate Professor of Cancer Biology

University of Massachusetts, *Identification of Citrullinated Biomarkers of Inflammatory Disease and Cancer*, Principal Investigator

Vicki N. Meyers-Wallen, VMD, PhD, DACT, Associate Professor of Genetics and Reproduction

American Kennel Club Canine Health Foundation, *Identification of an Ancient Mutation Associated with XX Disorder of Sex Development (DSD), an Inherited Cause of Infertility and Sterility in 28 Breeds*, Principal Investigator

NIH, *Identification of XX DSD Mutations by RNA-SEQ and Comparative Genomics*, Principal Investigator

John S. L. Parker, BVMS, PhD, Associate Professor of Virology

Mount Sinai NIH, *Short Term Training of Students in the Health Professions*, Principal Investigator

Mount Sinai NIH, *Studies of the Global Translational Response to Human Virus Infection*, Principal Investigator

Mount Sinai NIH, *Graduate Training Program in Comparative Medicine*, Principal Investigator

Colin R. Parrish, PhD, John M. Olin Professor of Virology

Mount Sinai School of Medicine, *NIAID Centers of Excellence for Influenza Research and Surveillance*, Principal Investigator

NIH, *Structural Controls of Functional Receptor and Antibody Binding to Viral Capsids*, Principal Investigator

NIH, *Host Cell Receptor Variation and the Control of Viral Cross-Species Transmission*, Principal Investigator

NIH, *The Evolutionary and Biological Bases of Host Switching in Viruses*, Principal Investigator

Alexander J. Travis, VMD, PhD, Associate Professor of Reproductive Biology

NIH, *Nanoscale Energy Production for Implantable Medical Devices*, Principal Investigator

SUNY Upstate Medical University, *Development of Hand-Held Biosensors for Rapid Diagnosis and Study of Neural Disease and Neurotoxins*, Principal Investigator

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

Cornell Feline Health Center, *Evaluation of Antiviral Drugs in an Air-Liquid Cornea Organ Culture System of FHV-1 Infection*, Principal Investigator

Morris Animal Foundation, *The Role of Citrullination in Canine Cancer Stem Cells: Opportunities for Novel Anti-Tumor Strategies and Biomarker Development*, Principal Investigator

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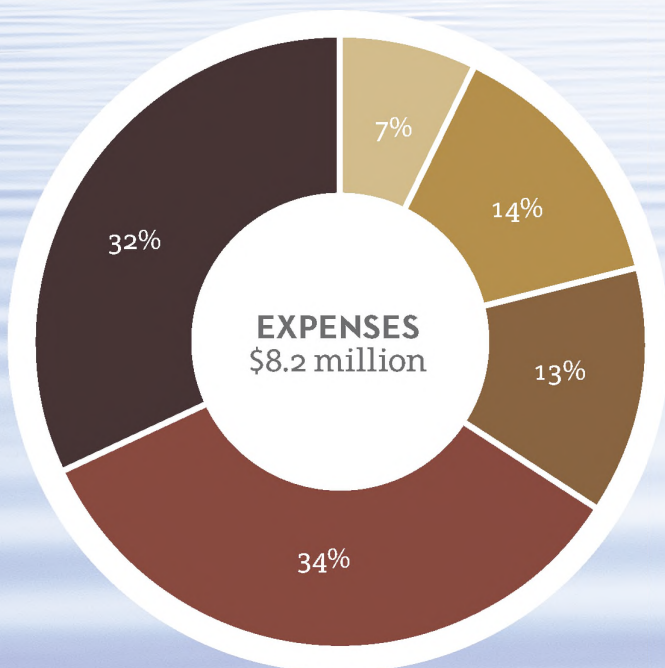
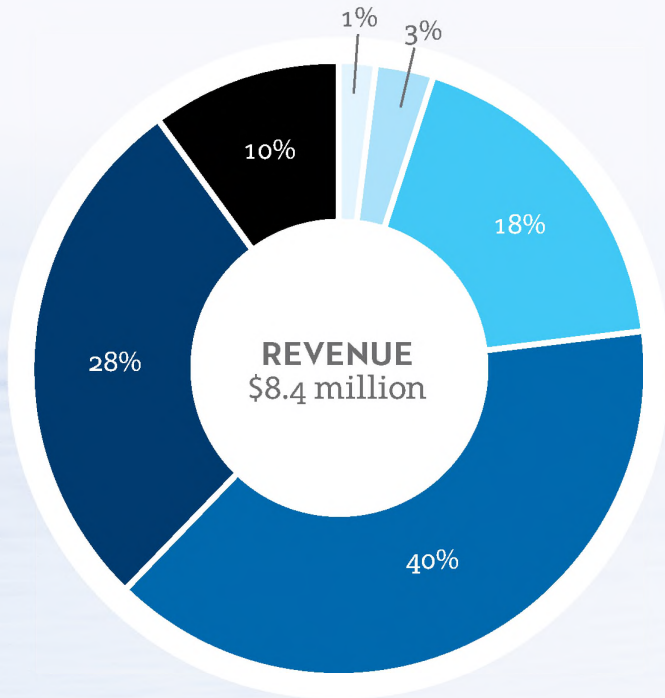
* Deceased



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