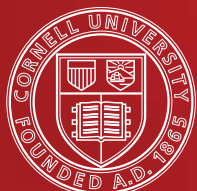


News from Cornell University's College of Veterinary Medicine

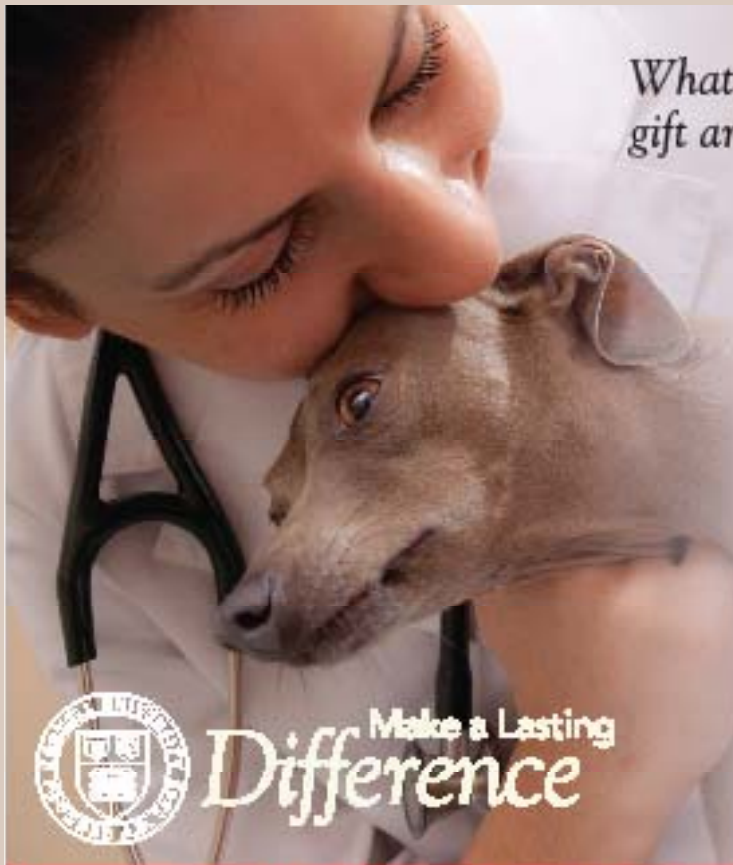
# 'Scopes

FEBRUARY 2011

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**ON THE COVER:** Cultures of mixed enteric bacteria from a clinical sample, grown on various agar media. Reagents within the media produce distinctive colony colors and morphologies that aid in the identification of the organisms present. Clockwise from upper left, the media are Eosin methylene blue (EMB) Levine, Brilliant green novobiocin, MacConkey lactose, and Columbia with sheep blood. Among the organisms seen is the common enteric bacterium *E. coli*, identified by its metallic appearance on EMB Levine agar (upper left) and bright pink color on MacConkey Lactose agar (lower right).

# CONTENTS

'Scopes • February 2011



I	A message from the Dean
3	News briefs
4	Triage of a different kind
6	Locating Lyme disease
8	Learning genes to label germs
10	Cross-continental collaboration
12	Super viruses need super sleuths
15	Verbatim
18	Healthy herds
20	Looking through the window
22	An agent of change
24	Funding globetrotters
26	Like my father did
29	Creative Ways to Give
30	Class notes

Inside back cover  
Class notes submission form

# DEAN'S MESSAGE

Dear alumni and friends,

These days there is a lot of discussion of our country's founders, and I am reminded that Cornell's founders, Ezra Cornell and Andrew Dixon White, envisioned and created a unique university in which the highest academic and scientific ideals would be harnessed to serve the public good. The extraordinary public/private partnership at the core of this endeavor continues to distinguish Cornell's leading veterinary college, providing us with the flexibility of action and the sense of purpose that is the foundation of our successes. This month we say a sad, but fond farewell to two of Cornell's legends, distinguished faculty who embodied the sense of purpose and leadership that has inspired countless alumni and colleagues. Drs. Robert Kirk and James Gillespie passed away on January 19 and January 10, respectively. I consider myself extraordinarily fortunate to have gotten to know Bob and Jim, and to have played a small part in keeping them connected to Cornell as their health declined. Fortunately both remained intellectually vigorous until their passing, and both were intensely interested in events at the College. In the next issue of 'Scopes, we will pay tribute to these giants, as well as several other legends and rising stars. In the meantime, I know that alumni and friends join me in mourning the loss of these members of our community, and in celebrating their lives and the impact they had on all of us.

In this issue of the magazine, we will highlight the Animal Health Diagnostic Center, and its fabulous new home — the New York State Veterinary Diagnostic Laboratory. Since 1912, the Laboratory has been an outstanding example of what our "founders" envisioned — an enormously successful public/private partnership that generates roughly \$2 for every \$1 invested by New York State, attracts and retains superb scientists in large part due to its integration within the larger veterinary college, and is a shining example of Cornell's commitment to public health and welfare. Without the Animal Health Diagnostic Center, Cornell would be markedly diminished, and absent Cornell's stewardship of our state's investment, New York would maintain a far less distinguished state diagnostic laboratory. The AHDC boasts a long list of landmark discoveries that support several of our state's most vital industries, ensures the safety of our food supply, and protects animals, people, and the environment



from infectious pathogens. However one of our most consequential "discoveries," was the creation of this historic partnership in 1966 with the New York State Department of Agriculture and Markets.

Partnerships can take many forms, and successful relationships require constant work and must meet the core needs of all involved. During this period of seemingly endless financial pressures, we have somehow managed to maintain and enhance this unique partnership. I would like to express my thanks to outgoing Commissioner Patrick Hooker, who has been a thoughtful and committed advocate of this relationship, and to

welcome incoming Commissioner Aubertine, with whom we look forward to working. Together we will continue to strengthen the AHDC and extend its successes. New York State agriculture and our other stakeholders deserve nothing less than our full measure of commitment to the ideals of our founders.

This issue of 'Scopes offers a snapshot of the positive energy, aspirations, and success that is possible when organizations join forces with a common purpose in mind. The stories on the following pages illustrate how the research of faculty like Dr. Craig Altier is transforming our understanding of food-borne and environmental pathogens, how innovative programs like the New York State Cattle Health Assurance Program are improving the health, welfare, and productivity of dairy cattle, and how faculty like Dr. Tracy Stokol are preparing the next generation of "disease detectives." I hope you enjoy these snapshots, which are only a few of the success stories that comprise the work that goes on in the new New York State Veterinary Diagnostic Laboratory and describe the ways that their extraordinary science serves the public good.

Cordially,

A handwritten signature in black ink, reading "Michael I. Kotlikoff".

Michael I. Kotlikoff, VMD, PhD  
AUSTIN O. HOOEY  
DEAN OF VETERINARY MEDICINE

# NEWS BRIEFS

## Sharing good work

Faculty and graduate student researchers presented on the College's many equine-related research projects in a series of posters and lectures on November 18, 2010, at the Veterinary Education Center. Members of the committee administering the Harry M. Zweig Memorial Fund for Equine Research attended the event to see the success of currently funded projects and to find possible candidates for future support.

## Rallying researchers

Research pioneers across the nation are working to unlock the vast hidden potential of stem cells, the body's building blocks with the power to transform into nearly any kind of cell. This year leading investigators from top institutions converged in Ithaca to present their research, exchange ideas, and discuss the wide frontier of stem cell research at Cornell University's Third Annual Stem Cell Symposium.

## Leader at the helm

Dr. Colin Parrish, the John M. Olin Professor of Virology, assumed the directorship of the Cornell University College of Veterinary Medicine's Baker Institute for Animal Health and the Feline

Health Center, effective December 1, 2010. Dr. Judith Appleton, the Alfred H. Caspary Professor of Immunology, served as the interim director since July 2009, leading the national search for this position.

## Lessons from the sea

Fish health specialist Dr. Paul Bowser of Cornell's Department of Microbiology and Immunology recently received his third award in the last four years. Bowser and his collaborator, New York Sea Grant Fisheries Specialist Dave MacNeill, accepted an award for Extension and other Outreach Efforts after using recent research results on Viral Hemorrhagic Septicemia Virus to educate the public and promote environmental stewardship. The Sea Grant Association bestowed its first "Research to Application Award" on October 20, 2010, honoring the duo's successful and continued application of SGA-funded research to help solve problems in the real world.

## From gene to organism

Fifteen faculty from disciplines across the university will combine their experience as research educators, thanks to a \$659,529 training grant from the National Institutes of Health encouraging the exploration of vertebrate developmental genomics. Awarded to Dr. John Schimenti, the grant will support three graduate students who have demonstrated an interest in both the subject and the collaborative research approach, engaging a new generation of scientists in multidisciplinary research with the potential to improve our understanding of genes' role in development. Spanning the lifetime of an organism, development encompasses processes from inception and growth to aging and death. Developmental genomics looks at development through a genetic lens and can help unlock the molecular mysteries of how cancer grows and spreads.



## Head farrier joins College

Steve Kraus joined the Cornell University College of Veterinary Medicine as the farrier, effective November 1, 2010. He will continue the great work of Michael Wildenstein, who was with Cornell since 1991, and has accepted an early retirement incentive offered by New York State. Kraus specializes in troubleshooting under-performing horses around the Finger Lakes Region of Central New York. His client list includes hunter/jumpers, dressage and event horses, polo, endurance, western performance, Morgans, and driving horses. He is the recent past president of the Western New York Farriers Association and a member of the Board of Directors for Region #5 of the American Farriers Association.

## Passing the banner

Dr. Rod Getchell has assumed leadership of the AQUAVET training program for aquatic medicine. After 25 years of service, Getchell's collaborator Dr. Paul Bowser has passed on the Associate Director's banner. As Associate Director, Getchell will organize the program's logistics, including everything from helping construct curricula, finding instructors, arranging field trips and accommodations, and booking teaching spaces, to orchestrating admissions and answering deluges of questions from prospective students. Throughout his work Getchell will carry on the program's tradition as the gold standard for hands-on training in aquatic medicine.







OPERATIONS

# TRIAGE

## of a different kind

The receiving area sorts, prepares, and delivers hundreds of samples daily



The job description might read something like this: Looking for someone to help organize chaos on a daily basis; master the habits of parasites, bacteria, and viruses; troubleshoot, multitask, and prioritize. Successful candidates will demonstrate high energy, attention to detail, and general knowledge about basic animal science.

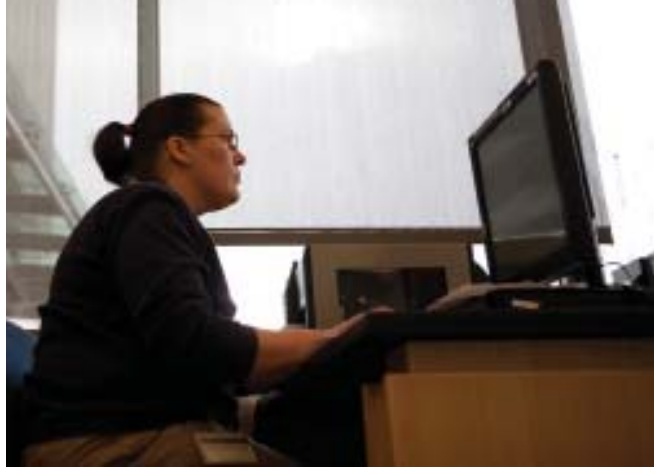
Employees in the receiving area at the New York State Veterinary Diagnostic Laboratory/Animal Health Diagnostic Center process up to 600 packages a day, with spring being the busiest season. Many of these packages contain multiple samples that veterinarians and clients hope will explain their animal's maladies.

Shipments arrive from a variety of sources, including UPS, FedEx, and the Cornell University Hospital for Animals. After assessing the contents, staff may need to split the samples (if tests have been requested from multiple labs); prepare the samples (for example, some liquids may need to be separated in the centrifuge); accession the samples to ensure quality control; and finally deliver them to the various labs.

There are no courses that prepare people specifically for this type of position, according to director Jeff Talcott, who has been with the laboratory for more than 30 years. Instead, people learn on-the-job, gaining insights as they go, such as these:

- Parasites settle to the bottom of a test tube, so taking a "sample" from the top of the tube is not effective.
- Antibodies are more stable than a living organism, so test for living organisms first.
- If you're looking for a virus, you can use isolation or fluorescent antibody methodologies.
- For serum neutralization, use heat inactivation.
- If you've heated a sample, it cannot be used for other tests.

"There is a certain level of knowledge about all of the disciplines that staff in the receiving room must have," said Talcott. "Beyond the knowledge, though, it's about an attitude. We're providing a service to the veterinarians and our diagnosticians who are trying to help a sick animal get better or maybe prevent an animal from getting sick. It's very rewarding to be part of that mission."



**The team of professionals in the receiving area ready samples for more than a million tests every year.**

# Locating Lyme disease

**NEW LYME DISEASE TEST REVEALS INFECTION HISTORY**



**Dr. Bettina Wagner developed new techniques for testing for Lyme Disease that are more accurate, specific, and sensitive than previous tests.**





**R**omping through summer fields seems like a harmless pleasure for dogs, horses, and humans alike. But just one bite from the wrong tick can rob an animal of that pastime. The bacteria *Borrelia burgdorferi* catch rides with certain species of ticks, and can infect animals the ticks bite with Lyme disease.

Lyme disease can cause a slew of debilitating symptoms from arthritis to outright lameness, heart palpitations and other cardiac complications, and neurological symptoms from chronic pain and weakness to paralysis. It's important to catch the disease early because it becomes progressively harder to fight as the bacteria conduct guerilla warfare from hiding places in the joints and organs of their hosts.

"The bacteria that cause Lyme disease are particularly difficult to detect," explained Dr. Bettina Wagner, Harry M. Zweig Assistant Professor in Equine Health, who teaches in the Department of Population Medicine and Diagnostic Sciences. "After infection they tend to hide where they can't be detected. They bury in the joints of dogs, causing arthritis or lameness. In humans and horses they also burrow into the nervous system, in the spine or even the brain, causing pain, paralysis, or behavioral alterations. By the time such clinical signs appear, the bacteria are usually not in circulation anymore."

Fortunately for hosts, infection with the bacteria causes the immune system to produce antibodies, pro-

**"We can now not only distinguish between infection and vaccination, but also between early and chronic infection stages. That was not possible before."**

TECTIVE proteins patrolling the highways of the blood, specially tailored to identify and fight specific pathogens such as harmful bacteria. Diagnosticians can test blood samples to see whether an animal has the antibodies made to attack *B. burgdorferi* bacteria. If the antibodies are detectable, the animal is likely infected.

"We've offered this kind of Lyme disease testing for years," said Wagner, "but we have recently been able to improve our techniques with a procedure called multiplex testing. The new test exceeds its predecessor in accuracy, specificity, and analytical sensitivity."

The improved test for Lyme disease in horses and dogs developed by Wagner and her colleagues takes less time, requires smaller samples, and answers more questions about the disease. In the past, diagnosticians had to run several tests to confirm Lyme disease. The multiplex procedure can detect many kinds of antibodies to several different antigens of *B. burgdorferi* using a single test on a single sample, eliminating the need for separate tests.

Bead-based multiplex technology has been around for the last decade, but the New York State Veterinary Diagnostic Laboratory/Animal Health Diagnostic Center (AHDC) is the first veterinary diagnostic laboratory that plans to use it for testing Lyme disease. Different kinds of antibodies

can be found in the body at different stages of infection. The new test can distinguish and measure these differences, giving more information about the timing of the disease.

"We can now not only distinguish between infection and vaccination, but also between early and chronic infection stages," Wagner noted. "That was not possible before. You were able to say whether an animal was infected, but not when it was infected, or how far the infection had developed."

The test and information it provides can help veterinarians make advanced decisions about treatment. After the long treatment period ends, veterinarians usually conduct follow-up testing to see if it was successful.

"We look at the improvement of clinical signs and for a decline in antibodies in the blood," Wagner said. "If the treatment starts late in the chronic stage, we often don't see that decline. It doesn't mean the treatment wasn't successful, but it does mean we don't expect the antibodies to decrease as rapidly. With the information the new multiplex test can give us about the stage of the disease in an animal, we know what to expect after treatment and can better measure its success."

The new multiplex testing procedure is currently being used internally at the AHDC and will be available to clients in the near future.

# Learning genes to label germs

**Genetic comparison can identify mystery pathogens**

scientists through the past 100 years. Smear a sample on an agar plate, a petri dish covered with gelatin made from seaweed, and study the culture as it grows. What shape does it take? Does it move or stay still? What is its biochemical profile? What food does it prefer? Scientists use these kinds of questions to match mystery organisms to those successfully identified in the past. But sometimes matching lists of characteristics isn't enough.

"We deal with some oddball organisms," said Dr. Craig Altier, a microbiologist with big aspirations for the future of identifying small life-forms. While traditional methods of identification can reliably distinguish common or easily differentiated organisms, they shed less light on outliers, including newly mutated species, rare breeds of bacteria, and fungi.

"Fungi look very similar under a microscope, and often biochemical differences between species prove unreliable for identification," said Altier. "We really needed a better way to tell species apart. When physical characteristics failed, we turned to genetics."

Organisms from all corners of the animal world arrive at the doors of the New York State Veterinary Diagnostic Laboratory/Animal Health Diagnostic Center (AHDC). Foreign or familiar, prevalent or peculiar, pathogens must reveal their true identities before veterinarians can begin to make sense of samples, diagnose diseases, and develop treatment plans.

How do you identify a microscopic organism? The traditional method has guided doctors and

Every person has a unique DNA fingerprint, and so does every species. Evolution shakes the genetic dice many times over, but all species have certain genes that survive unchanged for generations.

“These highly conserved genes usually code for essential functional elements that would not work if they were changed, such as proteins required for basic cellular function,” said Altier. “They don’t vary much between individuals, but they do vary across species. We can use these genes to accurately identify organisms.”

Researchers have already been looking at conserved genes to map out relationships between species, and now Altier and his colleagues are adapting these techniques for veterinary medicine.

“We have reached a point where we can use these tools quickly and efficiently to diagnose disease,” said Altier. “Human medicine will benefit as well, but the technique is most valuable in veterinary medicine because there are so many different species of host animals and pathogens.”

The new approach uses PCR (polymerase chain reaction) techniques to amplify DNA from selected conserved genes. Cornell’s on-campus DNA Sequencing Center decodes samples into a string of about 500 bases of A, T, C, or G, then compares them to samples in the National Center for Biotechnology



**Dr. Craig Altier and Medical Technologist Jennifer Starr use genetic comparison tools to precisely label organisms.**

Information’s genetic database to look for similarities.

The technique is already revolutionizing diagnostics, revealing relationships that could never have been found before. “One day we received a swab from the flipper of a sick sea lion,” said Altier. “We had no idea what organisms might live there, but we found the answer quickly through DNA sequencing and a quick genetic comparison. We couldn’t have done that without this database.”

Genetic comparison tools raise the bar for diagnostic accuracy. “With the old methods we frequently got stuck saying one organism is ‘like’ another,” said Altier. “Now we can usually hone in on a more exact label. We match sequences to find efficient, accurate diagnoses.”

Comparative genetics can also expand our knowledge of a given disease. “We may find the same kinds of pathogens in different animals we never knew could host them or on the same host species but at a different body site,” said Altier. “These techniques have already shed new light on how organisms evolve and how species are related. We may soon begin discovering important pathogens previously left unnoticed.”

Even unidentified organisms could prove priceless down the road. Many currently unidentified sequences float nameless through the database waiting to be compared. “When enough of these orphans begin to match,” said Altier, “we will begin to discover new disease-causing agents.”





# CROSS-CONTINENTAL COLLABORATION

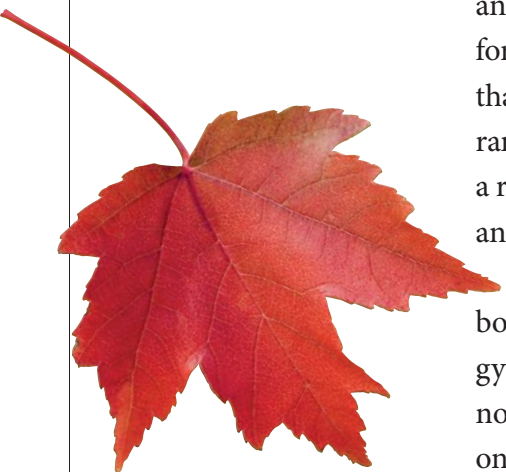
*Researchers find common ground to solve deadly challenges*

**L**ong before chocolate-covered pretzels arrived on grocery store shelves, people craved “sweet and salty.” During the Renaissance, people flavored wine with lead, a heavy metal that satisfies both sweet and salt urges. This could also explain why children find lead paint enticing. As satisfying as it may be, though, lead is also deadly.

Dr. Karyn Bischoff and her research team are collaborating with Korean scientists on several projects, including the identification of biomarkers for heavy metal poisoning. The global team is also studying mold toxins that infest agricultural feed supplies and toxic plants as part of a memorandum of understanding that extends through 2011. The partnership is a result of international conversations that uncovered mutual frustrations and aspirations.

“We have a similar climate, so molds and flora are similar, and we are both worried about lead poisoning,” said Bischoff, who leads the toxicology unit at Cornell’s diagnostic center. The New York State Veterinary Diagnostic Laboratory/Animal Health Diagnostic Center at Cornell maintains one of only a handful of full-service toxicology labs in the country. “In the animal health diagnostic industry, we’re all in this together. It doesn’t matter where animals are; the issues that affect them are relevant to people everywhere. Animal diseases don’t respect boundaries, and many are not specific to one host. All of the issues that we study impact consumers in some way, either as a health concern or as a financial challenge.”

The search for a fool-proof biomarker for lead poisoning has been stymied by two factors: Lead distributes itself in different bodies differently and attacks different bodies differently, making both blood concentrations and clinical signs ineffective measures.





**Dr. Karyn Bischoff wants to find biomarkers for heavy metal poisoning.**

Bischoff's results will have direct application to the dairy industry. Many cows are sheltered in barns that were constructed when it was permissible to put lead in paint. Even when a cow tests positive for lead poisoning, it is cost prohibitive to test the entire herd.

"This is an issue for at least two reasons," said Bischoff. "A sick cow may not act sick, and there is some concern that under the right — or wrong — circumstances, lead could find its way into the milk supply."

Bischoff and Korean veterinary scientist Dr. Hwan Goo Kang approached the problem from a new angle. Knowing that lead inhibits an

enzyme known as ALAD (aminolevulinic acid dehydratase), they developed a test that measures for the substrate of this enzyme, ALA in the blood. If the test reveals concentrations of ALA, lead may be to blame.

The agreement with the Korean National Veterinary Research and Quarantine Service (Korea's equivalent to the USDA) also supports investigations into the toxicity of red maple leaves, which are particularly harmful to horses. Research conducted for the last two decades has suggested that a specific acid is to blame. Karan Agrawal, a student researcher in the toxicology lab, believes that it is a combination of oxi-

dizing agents that sends horses into fatal respiratory distress, sometimes in a matter of hours.

"Eating as few as 25 leaves, about a pound, is lethal to a horse," said Agrawal, who noted that red leaves are most toxic during the fall foliage season. "We expect that our findings will be the basis for developing successful treatment options."

The researchers are also trying to negate the effects of toxic mold. Mus-ing about the feasibility of dumping a silo-full of contaminated feed, Bischoff added that once conquering the feat of destroying the food, farmers must then replace the food — sometimes a year's worth.

"It can put a producer out of business," said Bischoff, who explained three projects underway thanks to the collaboration with Korea.

Kang is looking for new testing options that will identify multiple compounds quickly and reliably. Currently, tests are slow and look for one compound at a time. Bischoff's team is investigating where fungi grow in wheat. If the fungus is near the base of the stalk, she explained, everything above that spot is safe to use. In addition, Bischoff is also looking for ways to use the fermenting process to detoxify moldy corn.

"We all want a 100 percent safe food supply," said Bischoff. "The reality is this is impossible as it would require testing every piece of food. The best use of our time is to find ways to prevent contamination in the first place. This will help us realize our — everybody's — ultimate goal: to ensure a wholesome and affordable food supply. That's why we're here."

# Training future leaders in diagnostics

## GRADUATION RARELY MEANS THE END

of education, especially in the medical world. A veterinary degree opens doors to countless further training opportunities. The College of Veterinary Medicine and the the New York State Veterinary Diagnostic Laboratory/Animal Health Diagnostic Center offer residency programs that let DVMs delve into the cellular side of disease. In the residencies for Diagnostic Sciences and Clinical Pathology, veterinarians wanting to gain more experience in diagnostics come to Cornell to practice for three years under the mentorship of seasoned specialists before testing to become board-certified specialists themselves.

### Residency in Diagnostic Sciences

Wonhee Cha pioneers the nation's first veterinary residency program in diagnostic sciences here at the AHDC. With a collection of experience in international clinical service and epidemiology research under her belt, she is honing her diagnostic skills in preparation for a future foray facing infectious diseases of the third world.

After earning her DVM from Kon-kuk University in Korea, Cha volunteered in Tan-

zania for two years as a public health veterinarian. "The entire country has just one veterinary school and about 250 registered veterinarians," said Cha. "Everywhere I turned, people and their animals needed help. One day I would be stitching up dogs or helping breed livestock, the next I would be educating farmers about husbandry techniques or working on establishing Tanzania's first x-ray-capable veterinary center."

Cha's commitment to international veterinary fieldwork blossomed during her tenure in Tanzania. "When I visited villages to vaccinate chickens against Newcastle Virus, I saw just how vital their animals' health was to their livelihood. People relied on their chickens for eggs, meat, and trade. Any infectious outbreak could be devastating." When the experience ended, Cha pursued her burgeoning interest in epidemiology at the laboratory of infectious diseases and molecular biology at Ohio State University, earning a master's degree.

"I was studying ways of detecting and differentiating types of the Avian Influenza virus," said Cha, "and I began to realize how important it is to have good diagnostic tools. Without accurate diagnostics, you can never



hope to study any epidemic. I wanted to learn these tools in a clinical setting.”

So Cha came to the College of Veterinary Medicine in 2008 to learn the diagnostic skills she needed, and to apply them to hands-on disease research at the College’s integrated hospital and diagnostic lab. As the solitary inaugural resident in the country’s first diagnostic sciences residency program, Cha is paving the way for the future of the field.

“We need more people who can do veterinary diagnostic work,” said Dr. Craig Altier, microbiologist at the AHDC and supervisor of the innovative position. “Most of us got our experience on the job. We were starting to worry about what will happen as we grow older. There are very few diagnostics training programs and it’s hard for a young person to get involved. So we worked to develop this new kind of residency.”

While other diagnostic residencies focus on a single area from the start, residents in this program spend the first year rotating through each of the AHDC’s thirteen sections, gaining an understanding of each diagnostic area and a comprehensive look at the field as a whole. In her first year Cha spent time in each section, including anatomical pathology, avian disease, bacteriology, clinical pathology, comparative coagulation, serology and immunology, endocrinology, molecular diagnostics, parasitology, quality milk production services, toxicology, virology, and veterinary support services.

“This is the only program that gives such an expansive overview, and that allows veterinarians to choose between different diagnostic specialties,” said Altier. “We want to train students who will become leaders in the field, with a broad enough scope that they could one day actually run a diagnostic laboratory.”

Following a year of rotations, Cha settled into the section of bacteriology, where she does a combination of fieldwork and research studying bacteria in dairy cattle of the New York State watershed. “Everyone is my teacher,” said Cha.



“I’m surrounded by a wealth of knowledge and experience, from the technicians to the faculty, everyone has so much to teach. I feel humbler every day.”

In her third and final year, Cha continues her work in bacteriology, hoping to finish her PhD before setting out to pursue her dream of addressing infectious diseases of animals in developing countries.

**Wonhee Cha is completing her final year with the nation’s first veterinary residency program in diagnostic sciences here at the AHDC.**

### **Residency Program in Clinical Pathology**

Sometimes you can look at an animal and know what’s wrong, but many mysteries of disease lurk far beneath the surface, in the cells themselves.

Clinical pathology residents Drs. Nora Springer and Erika Gruber ’06 are scientific sleuths who traded magnifying glasses for stethoscopes, investigating samples on

the biochemical and cellular levels to study and diagnose disease.

"We deal with swabs, smears, and samples from almost any fluid or part of the body," said Springer, who spent several years testing samples as a licensed veterinary technician before earning her DVM at Kansas State in 2008 followed by a small-animal internship at Louisiana State University. "This includes blood, urine, bone marrow, tumor cells, materials that can give cellular or chemical clues."

Clues can come from all kinds of cells, and part of a clinical pathologist's job is to recognize what is normal and what is not from each sort of sample. When a sample comes in, the clinical pathology residents provide the front line of investigation. After inspecting, describing, and forming a preliminary diagnosis, they consult with the lab's board-certified pathologists, Drs. Tracy Stokol, Heather Priest, and Deanna Schaefer, who look over the report and discuss it with the residents.

Unlike most pathology programs, the discussion doesn't stop there. Cornell's program encourages collaboration, and all five staff dedicated to clinical pathology pool their perspectives three times a week.

"I chose Cornell because of the program's strong structure and unique team-oriented approach," said Springer, who is in her second year of the three-year residency. "This is the only program I've found where residents and clinical pathologists regularly meet to discuss cases as a group."

"You gain a lot by hearing different opinions from people trained in different environments," said Stokol, one of the three clinical pathologists who supervise the program. "Our residents must do a rotation in anatomic pathology, and can also choose to rotate through other specialties, including oncology, toxicology, and large or small animal medicine. That's been very helpful for them."

**Cornell's program encourages collaboration, and all five staff dedicated to clinical pathology pool their perspectives three times a week.**

Clinical pathology residents divide time between clinical service and research, exposing them to both sides of the field.

"Cornell has a rich history and philosophy regarding research," said Stokol. "We expect our residents to complete a research project. We want to invest in them the intellectual curiosity of asking 'why is this happening' and 'how can I test that?' Residents challenging you is part of the fun. It makes you think about what you know. Is it based on true evidence or is it just something your teacher told you? It's good to challenge the status quo; that's how you learn new things."

"This program drew me because it's so well-rounded, emphasizing the diagnostic aspects of both research and clinical work," said Gruber, a first-year resident and Cornell alumna who returned after a small-animal internship at Colorado State followed by three years of veterinary relief work.

At the end of their three years of service, Gruber and Springer will apply their knowledge in a three-day examination for board certification in clinical pathology. Several career paths branch out for a newly ordained clinical pathologist. Some go on in academia, pursuing PhDs and becoming tenure-track research professors or opting for a clinical track position that emphasizes teaching and service. Others go into diagnostic practice in labs like the AHDC, or into private industry, particularly in the field of pharmaceuticals. The government offers further jobs for trained clinical pathologists.

"We need people who can spread their knowledge and educate the next generation," said Stokol. "We need future professionals who can encourage young people like Nora and Erika to go on in clinical pathology. The ultimate goal of academics is training our replacements. This is a challenging and rewarding field, and it's a pleasure to work with people who share your passion."

# THE FUTURE

## of Veterinary Diagnostic Laboratories

VETERINARY DIAGNOSTIC LABORATORIES WERE ESTABLISHED TO PROVIDE THE DIAGNOSTIC AND SURVEILLANCE TESTING, BOTH VOLUNTARY AND REGULATORY, NEEDED TO SUPPORT THE PRODUCTION OF FOOD AND FIBER ANIMALS IN THE US. THESE ACTIVITIES ARE CRITICAL COMPONENTS OF FARM-TO-FORK FOOD SAFETY EFFORTS, ENSURING FOOD AVAILABILITY, PROMOTING THE CONTINUED VIABILITY OF A MAJOR SECTOR OF THE ECONOMY AND PROTECTING HUMAN AS WELL AS ANIMAL HEALTH.

The capabilities of these laboratories have grown and changed to meet the changing needs of the animal agriculture industry. This includes broadening the base of species served from the traditional livestock species to non-traditional species, companion animals, zoo, exotic and wildlife species and expanding the types of production units covered from small commercial farms to much larger commercial facilities and backyard operations as well. Along the

way there have been significant innovations in the testing technologies routinely used as well as the scope of what diseases or conditions were tested for. Additional factors that have drastically altered the functions of the modern diagnostic laboratory include advances in information technology and the rapid expansion of global trade and transportation. Today it is commonplace for a diagnostic lab to receive samples not only from the state it is located in but, facilitated by the speed and ease of commercial shipping, from any

**THE CONFLUENCE  
OF TECHNOLOGICAL  
IMPROVEMENTS AND  
INNOVATIVE INFORMATION  
MANAGEMENT WILL  
TRANSFORM THE INTERACTION  
BETWEEN LABORATORIES  
AND CLIENTS.**

**Bruce L. Akey DVM, MS**

Assistant Dean for Diagnostic Operations  
Executive Director, Animal Health Diagnostic Center/New York State  
Veterinary Diagnostic Laboratory



point on the globe on a daily basis. The veterinary diagnostic laboratory is now a much more sophisticated machine, requiring a much broader array of subject matter expertise to effectively serve its clients.

Although changes in information technology have already had a marked impact on diagnostic labs, this has thus far primarily been in the areas of facilitating better record keeping, tracking samples and tests, reporting results and financial operations. While these have certainly been beneficial improvements, both to the laboratories and

their clients, the foundation of laboratory information management systems and now the additional tools for retrieving and further analyzing and manipulating the vast amounts of data generated daily can significantly increase the impact of the testing performed. Traditionally laboratories have been content to merely report the raw results of tests, often leaving the interpretation of the significance of those results up to the submitter to decipher. Even the addition of interpretive comments or reference ranges, while helpful, still leaves a significant

void to cross for the submitting veterinarian, much less the animal owner, in deciding what it all means and what actions to take or not. This situation can and will change. Using the information extraction, management, analysis and reporting tools now becoming widely accessible, laboratories can add tremendous value to the data they present by post-processing of the raw results to generate additional statistics (e.g. likelihood ratios, predictive values) which indicate just how significant those results are. Similarly, data can be presented in graphical formats (e.g. frequency distributions and trend lines) that

help put individual results in context by juxtaposition with reference intervals or other results and that introduce spatial or temporal axes to facilitate visualization of geographical relevance or trends over time. Efforts will be made to not only enhance the comprehension of a standard report but, leveraging the rapid growth of online access to results, provide clients with the ability to rapidly choose what results they want to see as well as the way they want to see them and print or save reports customized to their needs, rather than a “one size fits all” approach. The evolving disciplines of data visualization and infographics can be applied to significantly improve the comprehension and value of this information as well.

Diagnostic laboratories constantly seek to improve critical parameters of their testing services such as test turnaround time, accuracy and precision. The holy grail of tests of course is one that is 100% accurate, cheap and provides results the same day the sample is submitted. In pursuit of that perfection, laboratories have engaged new technologies and techniques, moving away from the traditional standards of slowly growing organisms then working to identify them, to increasingly sophisticated methods for detecting not only presence but quantity, not only species but subtype. Advances in automation of these techniques with software-driven sample preparation, handling and analysis, have also contributed to a remarkable reduction in turnaround time for testing. In the near future additional technologies and techniques such as meta-diagnostic tools, which allow for detection and identification of the genetic signature of all organisms in a sample stream, molecular typing not only for identification of organisms but to simultaneously determine other characteristics such as antibiotic resistance, and others will be moving from the research and development phase to routine production. Such changes will significantly reduce the time from submission to

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AS WITH ALL PARTNERSHIPS, THE SUCCESS OR FAILURE OF THE ONE HEALTH INITIATIVE WILL REST ON BUILDING A SOLID FRAMEWORK OF TRUST, MUTUAL RESPECT AND COMMUNICATION. ... THE VETERINARY DIAGNOSTIC LABORATORIES ARE ON THE BLEEDING EDGE OF THIS MOVEMENT, CHALLENGED TO FIGURE OUT HOW TO SUPPORT BOTH HUMAN AND ANIMAL HEALTH GOALS WITHOUT DAMAGING THE REASON FOR THEIR CREATION.

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result, improve accuracy as well as lower the total cost compared to the multiple individual tests that would be run to produce those same results today.

One Health and One Medicine are buzz words much in vogue in veterinary medicine today and diagnostic laboratories are caught up in this effort to enhance both animal and human health by coordination of efforts and improving information flow between the animal health and public health realms. However, participation in the One Health approach, while recognized as intrinsically logical and valuable, presents many challenges for diagnostic laboratories to address in the future. Since most diagnostic laboratories also serve as a part of the regulatory medicine team, the differing paradigms between public health and animal health regulators are problematic for the laboratories as well. While the basic goal of public health is “no one gets sick, no one dies,” animal health regulators accept a certain level of losses and may even order the destruction of animals for diagnostic or disease control purposes.

Public health decisions generally are not as constrained by potential negative economic impacts as animal health decisions. For the veterinary diagnostic laboratory, this can manifest as reluctance on the part of clients to submit samples for testing at all. This was perfectly illustrated during the recent efforts to increase surveillance for pandemic strains of influenza virus when fear of the conse-

quences of a positive test result all but eliminated sample submissions from the swine industry for swine influenza testing.

The resources available to address health issues are also substantially different between these two parts of the One Health continuum. This is reflected in a markedly lower level of funding for veterinary diagnostic laboratories compared to public health counterparts. This has been exacerbated by a trend of public health laboratories expanding their diagnostic activities, not only testing human samples but increasingly testing animal samples, usually for zoonotic diseases but sometimes for strictly animal diseases e.g. canine distemper. Such expansion threatens critical funding and political support for the veterinary diagnostic laboratories.

As with all partnerships, the success or failure of the One Health initiative will rest on building a solid framework of trust, mutual respect and communication. Thus far, there has been far more movement within the veterinary community towards this ideal than in human medicine it seems. There has hardly been a major national veterinary meeting in the last year that hasn't featured a significant session devoted to exploring the ramifications and implementation of a One Health approach. By contrast, few national meetings in human medicine have devoted time to this topic. The veterinary diagnostic laboratories are on the bleeding edge of this movement, challenged to figure out how to support human and animal health goals without damaging the reason for their creation.

The future of veterinary diagnostic laboratories, the potential to further evolve and improve the quality and value of the services they provide, is bright. The confluence of technological improvements and innovative information management will transform the interaction between the laboratories and clients. There has never been a more exciting time to be a part of the veterinary diagnostic laboratory world.

# Healthy HERDS

## CATTLE HEALTH PROGRAM HELPS HERDS AND HUMANS

**H**erds of grazing cattle set the classic backdrop of any drive through the Empire State. New York means cows, and not just because of the scenery. Dairy farms feed millions, providing the number one agricultural industry in the state, which ranks third in the US for milk production. The economy, natural resources, and public health of the state depend on healthy cattle. For that reason, New York State has developed a program to ensure the health, productivity, and stewardship of cattle and the farms they inhabit.

The New York State Cattle Health Assurance Program (NYSCHAP) provides a free service to any interested dairy or beef farm in the region. Funded through the state's Department of Agriculture and Markets, the program offers collaborative consultations with state or certified private veterinarians specially trained to work with farmers and their herd veterinarians to increase herd health, productivity, and profitability.

NYSCHAP works to assure food safety, public health, and consumer confidence in beef and dairy products that are sold in markets across the state and deck countless

family tables. The program also supports the region's natural resources by promoting environmental stewardship and best practices for waste management.

"Many issues face modern dairy and beef farmers, from maintaining a herd and managing disease to ensuring profitability and product quality," said Kathy Finnerty, who directs the program from her office in the New York State Veterinary Diagnostic Laboratory/Animal Health Diagnostic Center (AHDC). "When a farm enrolls in NYSCHAP, a team of advisors develops a plan for the herd, based on the goals and resources of the farm."

A NYSCHAP farm team consists of a state field veterinarian or certified NYSCHAP veterinarian, the farm's owner, the herd's veterinarian, key farm employees, and other consultants used on the farm. After reviewing basic information and conducting a walk-through risk-assessment, the team forms a herd plan, including a prioritized list of best management practices specifically tailored to the farm.

"Goals may include anything from increasing milk production and quality, to expanding the herd, to controlling disease," Finnerty explains. "The farm's staff and herd





veterinarian work together over the year to meet the agreed-upon goals, using the herd plan as a guide. Collaboration is key, and every member's input counts in forming and implementing the plan."

"It's free, voluntary, and confidential," Finnerty added. "The state pays for visits from both a state field veterinarian and the farm's own herd veterinarian. The veterinary visits, the team consultations, and the herd plan they produce can all have a great impact on the health and success of a farm. That translates to the health of consumers and the success of the state itself."

Extension veterinarians from the AHDC helped get the program off the ground in 1998. Today faculty from the AHDC continue to assist with the program, train veterinarians on pertinent topics, and meet herd veterinarians to discuss the use of new testing capabilities as these new tests become available. Participating farms receive significant discounts on certain tests at the AHDC, including Johne's disease testing and bulk tank culture testing for contagious mastitis, an infection of the udder.

All farms enroll in the core module,

which addresses biosecurity, food quality assurance, environmental stewardship, management of manure, feed, water, and facilities, and the possible introduction and spread of disease. Farms may also enroll in individual modules tailored to specific diseases, including Johne's disease, bovine viral diarrhea (BVD), *salmonella*, bovine leukosis, mastitis and milk quality, and environmental pathogens. Other modules specifically address beef quality, herd expansion, and cattle welfare certification.

Currently 870 farms throughout New York State participate, including 60-70 beef farms, and 35% of all dairy cattle farms in the state. Farmers interested in enrolling in NYSCHAP can contact their herd veterinarians or go online for more information at <http://nyschapp.vet.cornell.edu>.

NYSCHAP utilizes 11 NYS Department of Agriculture and Markets field veterinarians, and offers a training program for private practitioners. Veterinarians interested in becoming certified complete a training class or submit a certification test. Contact Kathy Finnerty, NYSCHAP Coordinator, at [kdf2@cornell.edu](mailto:kdf2@cornell.edu) for more information.



**Kathy Finnerty spends most of her time with producers on their farms, discussing issues that range from disease control to the bottom line.**

# Looking through the window

*Clinical pathology bridges animals and answers*

**“BLOOD IS THE WINDOW** to the body,” said Dr. Tracy Stokol, a professor with a passion for pathology

puzzles. Microscopic magnification opens that window, revealing a cellular world which veterinarians explore in the quest to analyze disease. Clinical pathologists like Stokol navigate that world as diagnostic detectives, using cellular samples from body tissue and fluids to piece together a patient’s story.

If an animal has a bodily bump, how do you tell if it’s a bruise or inflammation, a fatty tumor or malignant cancer? Veterinarians use needles to take samples for examination. Clinical pathologists use these cellular clues to solve medical mysteries.

“It’s critical for veterinarians to know clinical pathology because they use it every single day,” said Stokol. “Sick animals can’t tell you what’s wrong. Samples speak for the animals and clinical pathology translates. It’s a bridge between the animal and the answer.”

Body fluids can reveal much of what goes on inside an animal’s body. “Blood can tell you why a joint is swelling, expose cancer cells, or show abnormalities that indicate underlying liver disease,” illustrates Stokol. “We also work

with bone marrow aspirates, samples from lymph nodes, cerebrospinal fluids, anything you can put a needle into and take a sample of could give an important clue.”

Stokol has taught the visual language of cellular samples at the College of Veterinary Medicine since 1993 and is now an associate professor in the Department of Population Medicine and Diagnostic Sciences and director of the clinical pathology section of the Animal Health Diagnostic Center. A skilled specialist, Stokol attributes her passion for clinical pathology to the fun of solving a mystery.

“I like a challenge,” said Stokol with steady eyes that have faced plenty of challenge in the microscopic realm. “I’m always intrigued by difficult cases and love figuring things out. Clinical pathology is a very visual field. You’re seeing interesting changes that are visually fascinating. It’s fun to look at things, but it’s also about putting pieces of information together to make a story.”

Stokol’s story started in Melbourne, Australia, where she earned her veterinary degree in 1987, worked for two years as an assistant veterinarian, and earned a PhD before coming to Cornell. She belongs to several societies for clinical pathology, chemistry, and diagnostics, and has published several book chapters





**Dr. Tracy Stokol solves medical mysteries as a clinical pathologist ... and teaches others how to do it as well.**

and over 50 papers in peer-reviewed journals, reflecting her dedication to furthering research in her field.

“Research stimulates a kind of intellectualism you don’t get from puzzling out a case. It’s an entirely different way of thinking,” explained Stokol. “A lot of what we do in clinical work is memorizing facts and recognizing patterns. Research allows you to ask more kinds of questions, it makes you think ahead and plan, and learn to deal with things that don’t work out the first time.”

That’s why Stokol and her colleagues require that the College’s clinical pathology residents complete a research project.

“Working in an academic environment, we need to advance the knowledge of our field,” Stokol said. “We have to continue to grow and understand more about the diseases we’re working with and the only way to do that is through research.”

As an academic clinician, Stokol furthers her passion through teaching. Together with fellow clinical pathologists Drs. Heather Priest and Deana Schaefer, Stokol supervises the College’s residency program in clinical pathology, preparing specialists in this field with training to learn to successfully sort out the secrets cells can tell.

“One of the job’s biggest appeals

is the instant gratification, knowing that you’re making a difference,” Stokol said. “Clinical pathology gets rapid results that help animals and their owners almost immediately. You’re giving vital information that a veterinarian can use to decide how to manage or treat a patient, or helping an owner make a decision about whether to continue a treatment. We can make a diagnosis and know we’re having a real effect.

“I like that I can do everything with clinical pathology at Cornell,” said Stokol. “Service helps patients in real-time, research expands our knowledge, teaching ensures the future. It’s the best of all worlds.”



# An agent of **CHANGE**


**DR. SALIKI TACKLES GLOBAL VIRUSES  
EVERY DAY IN HIS ATHENS LABORATORY**

**Dr. Jeremiah Saliki** PhD '93 is on a mission: to have a positive impact on the health of animals and, by extension, the well-being of people. There is a global need for this, he said, but nowhere is the need greater than in Africa.

“Working in the field in Africa, I saw devastation,” said Saliki, recalling outbreaks of Foot-and-Mouth Disease, Peste-des-Petits-Ruminants (small ruminant plague), and Rinderpest (a viral disease that attacks cattle in exotic areas). “I knew I had to be a more effective agent of change to help combat the suffering. When you witness devastation, it is important to empathize with those suffering and to help in the moment. But for those who can, we must turn our attention to the future and work diligently toward eradicating these diseases for good.”

Saliki is uniquely positioned to help the international community of diagnostic scientists do just this. A Belgium-trained veterinarian and a native of Senegal, he is prepared to serve at the intersection of animal and human health. His doctoral training—under Cornell University professors Dr. Ed Dubovi at Cornell’s Animal Health Diagnostic Center and Dr. Alfonso Torres—was conducted at Plum Island and prepared him with the tools to make an immediate difference.

“Every day that I do diagnostic work, I see the impact on animal health,” said Saliki, who specializes in virology. “It is instant gratification. Basic science can take years, or decades, to come to fruition. Sometimes, your life’s work is not put to use until after you are gone. As a diagnostician, I see progress every day. Technology, especially used in conjunction with conventional techniques, improves



Dr. Saliki says the future is shrinking, referring to the technology that drives discovery.



our chances with every new tool. I have watched scientists eradicate Rinderpest. I know success is possible. When you combine diagnostic investigation with curiosity and compassion, you will see results.”

Saliki is the laboratory director and head of the Virology/Serology section at the Athens Veterinary Diagnostic Laboratory and a professor of virology at the University of Georgia. He serves on the editorial board, the publications committee and the virology committee of the American Association of Veterinary Laboratory Diagnosticians. He conducts quality assurance and laboratory biosafety and biosecurity

workshops for colleagues across the world; serves as the principal investigator for nationally funded research projects; and has authored many book chapters, monographs, scientific articles, and reviews. Since 2004, he has also served as the editor-in-chief of the only journal that focuses exclusively on diagnostic science (the *Journal of Veterinary Diagnostic Investigation*), leading the charge to disseminate knowledge and improve how diagnostics are done.

“The future is shrinking,” said Saliki, referring to the size of a diagnostician’s computerized tools. “We are experiencing miniaturization — which leads to increased throughput

and productivity — as well as multiplexing, the ability to conduct several tests in a single run. These are important trends, but should not come at the expense of classical diagnoses. Veterinary diagnostic laboratories are historically the main source of animal vaccine materials, comprised of bacteria and viruses that are routinely isolated and identified at the bench. We must not lose these conventional skills. Culturing viruses and bacteria takes patience, but it is the key to identifying new agents and to producing vaccine candidates.”

Following his own advice, Saliki uses both conventional and modern techniques in his work. He has developed monoclonal antibodies (an antibody derived from a single cell for use against a specific antigen), which led to the molecular characterization of various viruses and the development of new diagnostic tests for both Bovine Viral Diarrhea, which has been licensed to IDEXX and is commercially available worldwide, and Peste-des-Petits-Ruminants.

“Tests like these and the knowledge that members of the international diagnostic community have generated have benefited countries across the world, including Africa,” said Saliki. “In addition, I remain involved in the training of veterinary diagnosticians in Africa. The training that I received at Cornell — at the world’s premier diagnostic institution — was highly efficient and very comprehensive. It prepared me to make an impact on animal health by joining others in the efforts to combat devastating conditions through my laboratory work, editor responsibilities, and training activities.”

# Funding globetrotters

## GRANTS GIVE STUDENTS VETERINARY EXPERIENCE IN DEVELOPING NATIONS



Working abroad can change your life,” said Dr. Ton Schat, an avian pathology professor whose veterinary adventures abroad helped forge a fruitful career. “That kind of eye-opening experience affects all the people and animals you help as a veterinarian and shapes the kind of person you become.”

He hails from Holland, battled bacteria in Nigeria, launched labs against Marek’s disease in Mexico, and recently returned from an Australian excursion studying one of the more dangerous strains of Avian Influenza. With Cornell as his home-base since 1975, he has continued collaborations with researchers around the world. Best known for his industry-changing work improving poultry health for which he recently received a lifetime achievement award, Schat attributes the inspiration and success of his career to his early experiences abroad.

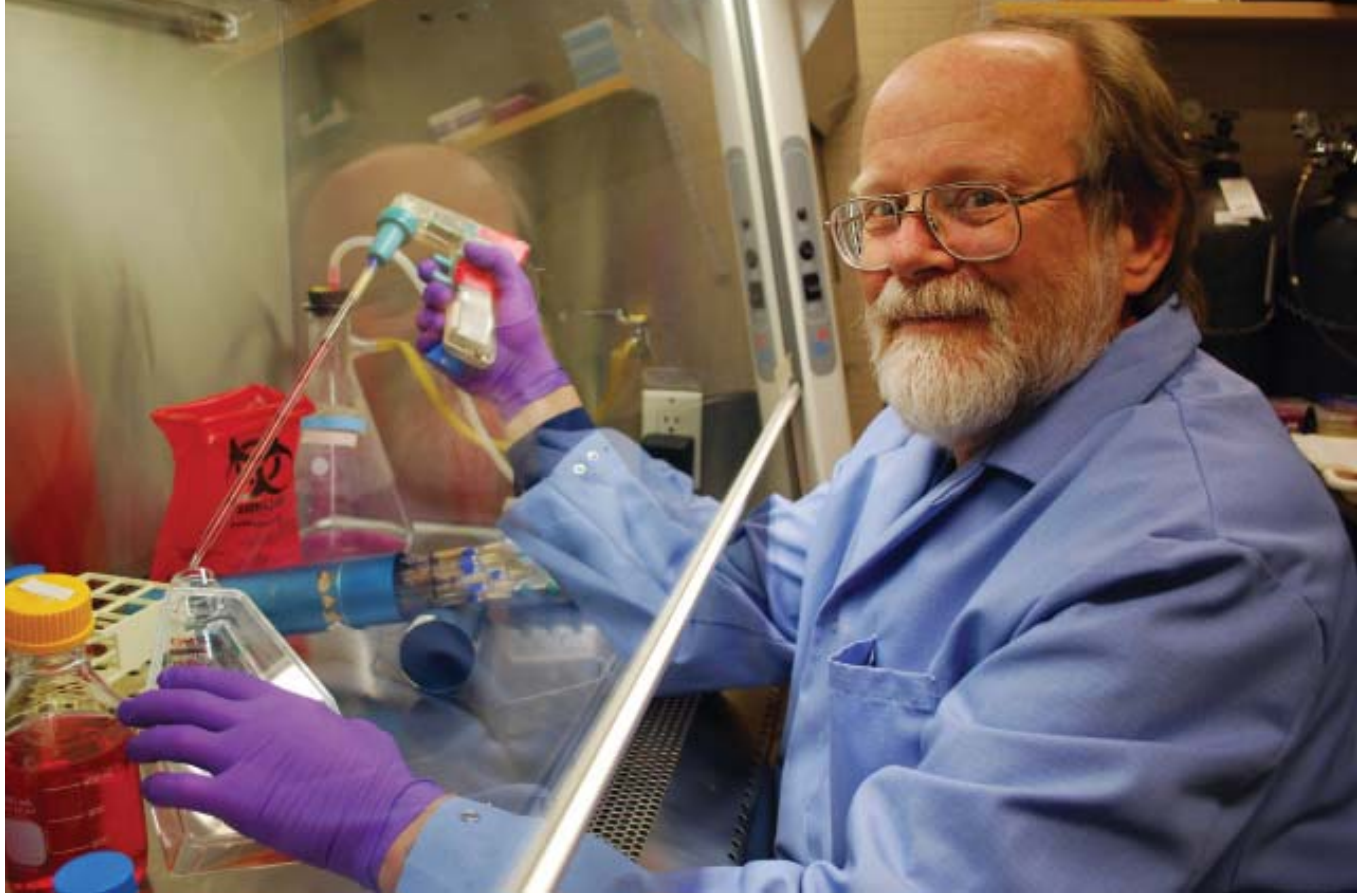
“I knew early on that I wanted to pursue international development,” said Schat, who earned his DVM degree from the State University of Utrecht in the Netherlands. “During my final and practical year of my studies in Utrecht I went to Northern Nigeria on a fellowship to study causes of infertility in Fulani cattle. I really enjoyed my months there, from the hands-on work to interacting with the Nigerian students.”

Schat returned from Nigeria determined to pursue international work before going to graduate school. “I landed a job through the Dutch government to work on Marek’s disease in Mexico. I arrived in 1971 and worked there for four years, setting up a lab, training Mexican researchers, and working toward a vaccine.”

In Mexico, Schat met Dr. Bruce Calnek, an avian pathology professor from Cornell who shared Schat’s growing interest in Marek’s disease. Calnek invited Schat to work in his lab as a graduate student, and Schat has worked at Cornell ever since. While pursuing his PhD, Schat isolated the SB-1 strain of Marek’s disease in chickens and used it to develop a vital vaccine still used on the market today. The vaccine generated significant royalties for the College and continues to generate income.

Most of that money went back to the former Department of Avian





and Aquatic Animal Medicine, pooling with other departmental money to support grad students and research expenses. When the department later merged into the Department of Microbiology and Immunology and the flock of avian medicine students pursuing PhDs thinned, the money lay dormant for many years.

“Dr. Calnek was in charge of the former department’s funds,” said Schat. “When he retired in 1996 I was charged with overseeing their use.”

The Expanding Horizons program seemed like the perfect choice for Schat, who shares its core philosophy: that working in developing nations empowers students to improve themselves and their world. Expanding Horizons, funded to date with generous support from the Lincoln Ellsworth Foundation, provides Cornell veterinary students with grants to spend six to 10 weeks in a developing nation engaged in a hands-on veterinary experience or research project. Projects span the veterinary spectrum, from rehabilitating wildlife or teaching farmers vaccination techniques, to researching rhino parasites or promoting habitat conservation. Students have traveled to all corners of the world, including

Kenya, Madagascar, Honduras, Bolivia, Italy, Vietnam, Thailand, Taiwan, and many more.

“More students are growing a keen interest in reaching out to the world around them,” said Schat, who teaches a biannual course in international veterinary medicine that has grown to an average class size of 60 students. “For most students who have gotten the chance to go abroad, it has opened their eyes and broadened their perspectives. My own time abroad was crucial to my personal development. I feel it is extremely important for our students to have the same kind of experience that was for me so life-changing.”

“Since the program began in 1985, we have been able to support five to 10 students a year,” said Jai Sweet, director of student services and multicultural affairs, who oversees the Expanding Horizons program. “This new fund sets the foundation for a steady, stable stream of support that will ensure more students can continue to pursue these extraordinary international opportunities.”

Should you have an interest in contributing to the Expanding Horizons program, please contact Amy Robinson in the Alumni Affairs and Development Office at [amy.robinson@cornell.edu](mailto:amy.robinson@cornell.edu) or 607.253.3742.

**Dr. Ton Schat's gift will assist students in their quest to experience international medicine.**

# Like my father did

*Dr. Tevis Goldhaft combined an entrepreneurial spirit with common sense ingenuity to show the world the power of veterinary medicine*

**D**r. Tevis Goldhaft '35 took life — and living it — seriously. He was a top student — from the time he was a youngster in grade school through veterinary training — and he began working when he was just 11 years old, often speculating later in life that his success was due to his work ethic. But, no one would ever have considered him a book worm, given his mastery of a goal that eludes many: the ability to balance work and play.

Sharing the best piece of advice he ever received with fellow classmates during his 65th class reunion in 2000, he explained how he managed to both sit at the head of the class and have fun: “When my classes were over at two, three or four o’clock in the afternoon, I went home. But I didn’t put my books away and play bridge or play baseball or football or cards. I did my homework, from three to five, five thirty. Then I had dinner, and then I could do whatever I wanted every night, but my work was done.”

This appears to be the mantra by which he lived: work hard and play hard. One of the few Cornell veterinary college students to live in a fraternity, Goldhaft served as the chancellor of Beta Sigma Rho for his junior and senior years. He spent many evenings cavorting with fellow Cornell students, including his future wife of 46 years (Bryna Goldberg), but, he recalled, his work was always done. “I was never a week behind, a month behind.”

In fact, he was usually ahead of his time. Proud to be a member of the last class of Cornell veterinary students accepted straight out of high school, Goldhaft was one of the few who came to college with practical experience, propelling him to the head of the class.

“Because of my experience with my father who was a veterinarian, I had practical knowledge for handling animals,” Goldhaft



**Dr. Tevis Goldhaft served as Chairman of the Board of Directors of Glassboro State College, which is currently known as Rowan University, in New Jersey.**

## Enduring Legacy

EDITOR'S NOTE: Dr. Donald F. Smith, dean emeritus of Cornell University's College of Veterinary Medicine and professor of surgery, brings veterinary medicine's rich and enduring legacy to life in accounts of veterinarians who advanced animal health during the past 100 years. Through interviews with veterinarians or surviving family members, Dr. Smith captures fascinating accounts of the personal and professional lives of veterinary practitioners, industry leaders, and animal health experts. Please enjoy the excerpt below from the interview Dr. Smith conducted with Dr. Tevis Goldhaft. For the complete interview, and interviews with many others, please visit [www.vet.cornell.edu/legacy](http://www.vet.cornell.edu/legacy).

**DR. SMITH:** Was there ever any question that you would go back to work with your Dad in the vaccine business?

**DR. GOLDHAFT:** I had no problem with that. When I was in high school I got a job with the State of New Jersey. I worked on a New Jersey egg-laying farm

where they had 100 individual houses — small houses — and each one had 12-13 pullets and one rooster. They were breeding tests and they had to be trap-nested<sup>[1]</sup> five times a day. I recorded when they laid eggs. I worked there for two or three summers, starting as a sophomore in high school.

I'll never forget when I got the first check: \$60 for a month's work. I took it to the bank — I was 13 or 14 years old. But the teller in the bank asked me where I got the check. I told him I worked for it. So he said, “Well, let me check into it.” He went in the back room and he called my father and he said, “Your son's in here with a \$60 State check. Where did he get it?”

From then on, I had no problems. I worked for three years taking care of poultry. I was good at it. I could handle the work when guys would go on vacation. It was no problem for me at all. I knew the husbandry of poultry-raising, and I was interested in it.

*[1] Laying nests that allow operator to determine the number of eggs produced by each hen.*



said, also at his 65th reunion. "I remember when they took us to the barn with beef cattle. They asked if any student would like to go in and demonstrate how you hold one of these cows. A couple guys went in, and they got thrown for a loop. So I said, 'I'll go in.' And I went in, and I did it like my father did. I put my fingers in the nose, grabbed the horn, stood alongside of him, and grabbed the horn on the other side of him. I held his nose and held him tight so the doctor could examine him, and the instructor said, 'Where did you learn that trick?' and I said to him, 'My father's a veterinarian. I used to

go with him all the time, and I know how to do it."

Upon graduating, Goldhaft married and returned to Vineland, New Jersey, to work alongside his father, several other family members who were also trained veterinarians, and collaborators from around the world. Combining practical ingenuity with entrepreneurial mettle, the team made history with novel vaccinations for poultry and other species.

"My whole active life in the field," recalled Goldhaft at his reunion, "was based around preventing not finding a cure. ... I'm glad I did it that way. ... It was the way of the future at


that time. ... It was a unique approach, not to treat them, but to prevent the problem."

In one of his final contributions to the profession, Dr. Tevis Goldhaft left a considerable portion of his estate to the College of Veterinary Medicine at Cornell University. His foresight and generosity will continue to fuel the College's mission to advance the health and welfare of animals and people. Unrestricted gifts such as his are often used to assist new faculty who are launching their research efforts, efforts that may result in new vaccines just like those developed by Goldhaft.


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# CREATIVE WAYS TO GIVE

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## C-ING INTERNALLY

Bring a new way of imaging to the Companion Animal Hospital. A C-arm fluoroscopy unit would offer state-of-the-art imaging capabilities, helping doctors view internal structures with extreme precision. The services of Orthopedics, Neurology, Cardiology and Soft Tissue Surgery would all benefit. \$200,000

## LARGE-BREED LAMENESS

Advance our ability for arthroplasty services. This equipment is needed to support a study which hopes to eliminate forelimb lameness in large-breed dogs such as Labradors, Newfoundlands and Rottweilers. \$16,341



## A ONE, TWO, PUNCH

Shorten surgery time for horses needing respiratory intervention.

A new method of surgery requires a Needle-Punch II. This instrument allows for a new method for performing standard upper airway surgeries including laryngeal tie-forward and laryngeal tie-back, the most common surgeries we perform in horses. The new method and equipment shortens the surgery time and increases the precision of suture placement. Large Animal Hospital.

\$3,150

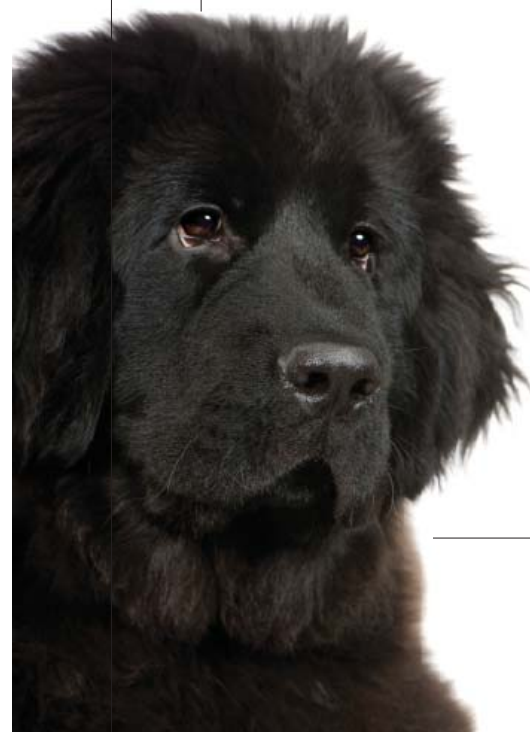
## HEART SMART

Help improve the quality of examinations by updating our ultrasound probes. Cardiology. \$8,000 per probe

## VERSATILITY

Allow a surgeon to perform not only free-hand surgery supported by different handpieces, but also endoscopy using rigid or flexible endoscopes with the purchase of a diode laser. The diode laser has expanded the possibility of laser surgery for many procedures. Laser surgery advantages include little or no bleeding, less pain, reduced swelling and infection and faster recovery.

\$13,995



# CLASS NOTES

## 1951

**Donald J. Elliott, DVM**, New Berlin, NY / Titusville, FL

Hope to see everyone next year at reunion #60.

## 1952

**John J. Brennan (Jack), DVM**, Guilderland, NY 12084

[saranacjack@yahoo.com](mailto:saranacjack@yahoo.com)

Dr. John "Jack" Brennan, founder of Guilderland Animal Hospital in 1955, who also worked for three years for the New York State Racing and Wagering Board as a veterinarian both at Saratoga Race Course and Saratoga Raceway, is the author of the recently published book about "my years in veterinary medicine, how I developed my interest in the profession and many vignettes, experiences that only veterinarians are likely and lucky enough to share." To order your copy, NYS residents send \$24.50 (this covers the cost of book, shipping and NYS tax); Non NYS residents \$23.00. Send your check to Brennan Books, PO Box 185 Guilderland, NY 12084

Visit *The Record* (Troy, NY), Dec. 18 edition, to see the article that shares information about his career, hobbies, and book.

**John H. Baldwin, DVM**,

Greene, NY / De Leon Springs, FL

Enjoying retirement, six months in New York, six months in Florida.

## 1954

**Robert F. Kahrs, DVM, PhD 54**, Saint Augustine, FL

A new bi-weekly feature, *Farm Animal Health*, written by Dr. Robert F. Kahrs for the *St. Augustine Record's* online publication will address farm animal and equine health. While describing challenges facing farmers, animal lovers, and veterinarians who try to keep livestock and horses healthy, the series will discuss infections, injuries, reproductive and birth difficulties, poisonings, genetic defects, nutritional deficiencies,

and large animal health issues. Robert has lectured widely on cattle diseases, food safety, international trade in animal products, and veterinary education. He has published more than 100 articles. He is the author of books called *Viral Diseases of Cattle*; *Global Livestock Health Policy*; *Mastering Scientific Writing*; *The Highway to Writing Success*; and *So You Want To Be a Veterinarian*.

## 1961

**Joseph P. Renaldo, DVM**, Plummer, ID

Dr. Joseph and Joan Renaldo recently celebrated their 50th anniversary. After meeting on a blind date, Joe and Joan spent many days together. Then one day a ring was placed in a bucket of berries and the rest is history. Joe established and operated the Oneida Animal Hospital after graduating from Cornell University. Joan was a stay-at-home mom, nurse, and travel agent after graduating from St. Elizabeth's School of Nursing. Joe and Joan moved to Idaho after Joe's retirement and now live in the country outside of Plummer where they fish and travel.

## 1966

**Martin Wolf, DVM**,

[mardebwolf@msn.com](mailto:mardebwolf@msn.com)

Is now enjoying retirement and is as busy as ever. We spent two weeks in India in November and two weeks in Israel in October.

## 1976

**John F. Gross, DVM**, Winthrop, ME

John Gross was recently inducted into the University of Maine Engineering Francis Crowe Society. John earned a B.S. and M.S. in Mechanical Engineering from UMaine in 1967 and 1971, respectively, and later earned a doctorate in veterinary medicine. John retired from Winthrop Veterinary Hospital in Winthrop, Maine,

in 2006 after 28 years with the hospital. He now enjoys flying his single-engine airplane and supporting environmental causes.

The purpose of the Francis Crowe Society is to recognize UMaine engineering graduates as they accomplish the formidable goal of completing their engineering degrees and to recognize others who have made considerable engineering contributions and honored the profession.

## 1981

**Laurence J. Gleeson, PhD**, Killarney, Australia

Awarded by the Australian Veterinary Association, the Kesteven Medal is for distinguished contributions to international veterinary science in the fields of technical and scientific assistance to developing countries. Born and educated in Warrnambool, Australia, he graduated from the Melbourne School of Veterinary Science in 1968. After five years in mixed veterinary practice, he undertook post graduate training in virology, first completing a MVSc with Michael Studdert at Melbourne and then a PhD with Leroy Coggins at Cornell. In 1997 he joined the World Organization for Animal Health to set up the regional foot and mouth disease control program for Southeast Asia. He returned to the Australian Animal Health Laboratory in late 2001 and worked on foot and mouth disease and international programs until he resigned in early 2006 to accept a position based in Bangkok with the Food and Agriculture Organization as the regional manager of Highly Pathogenic Avian Influenza program for Asia and the Pacific. Since his retirement in October 2008, he has continued to undertake consulting work in the region with FAO and other agencies. Laurie was awarded the Kesteven Medal by the AVA in 2010 and now lives back in Killarney near where he grew up.

## 1994

**Joseph Impellizeri, DVM**, Wappingers Falls, NY  
[oncologyvet@yahoo.com](mailto:oncologyvet@yahoo.com)

We have expanded the Department of Oncology with the region's Bone Marrow Transplant Center for K9 Lymphoma. Besides heading the BMT unit, I am also an adjunct professor of Biology at Vassar College and the Medical Director of the Veterinary Specialty Center of the Hudson Valley where we are collaborating with the Animal Medical Center of New York City for a clinical study to evaluate a new protocol for K9 Hemangiosarcoma ([www.vschv.com/clinical\\_trials.php](http://www.vschv.com/clinical_trials.php)). Come visit whenever you are in the area.

## 1997

**Kristina Rasa Vygantas, DVM**, Clarksburg, NJ

One of few veterinary equine ophthalmologists in the state of NJ, Vygantas offered a lecture on the equine eye at Rick's Saddle Shop, Cream Ridge, NJ. She currently works with NorthStar Vets, Millstone, which will relocate to Robbinsville early next year.

## 2003

**Christopher G. Byers, DVM**, Gaithersburg, MD

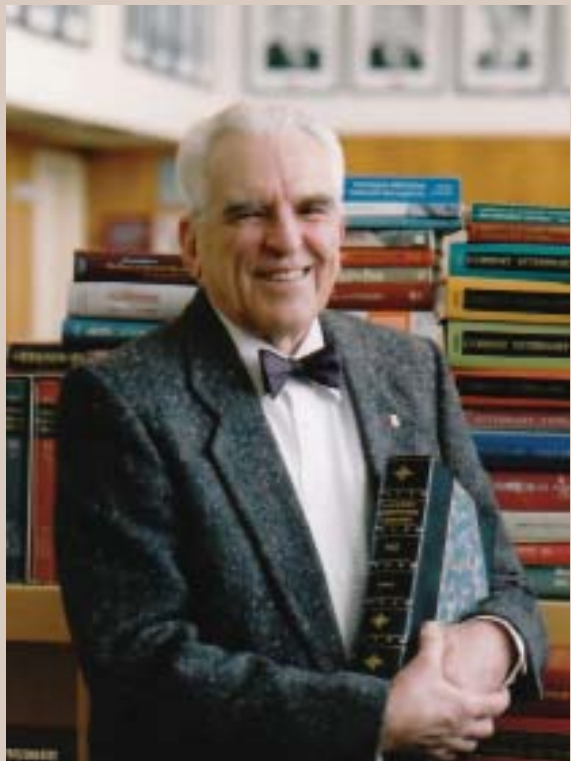
In a podcast on the AVMA website, Christopher, a board certified internist and critical specialist, and the director of intensive care at VCA Veterinary Referral Associates in Gaithersburg, MD, talked about Cushing's disease in dogs. Link to AVMA Media (click on podcasts) [www.avmamedia.org/](http://www.avmamedia.org/)

## 2004

**Nicholas Haley, DVM**, Loveland, CO  
[njhaley@lamar.colostate.edu](mailto:njhaley@lamar.colostate.edu)

Finished a PhD in Pathology (Summer 2010) focusing on the routes of transmission of chronic wasting disease (CWD) of deer





On January 19, 2011, Cornell's College of Veterinary Medicine and the profession lost a legend: Dr. Robert Kirk.

## IN MEMORIAM

SINCE THE LAST ISSUE OF 'SCOPES, THE COLLEGE HAS BEEN NOTIFIED OF THE PASSINGS OF THE FOLLOWING:

**Dr. John L. Hyde (Jack) '54**, April 19, 2010  
**Dr. Philip H. Liebig '45**, April 21, 2010  
**Dr. Vader M. Loomis '50**, April 23, 2010  
**Dr. Lennart Krook, Emeritus professor**, April 24, 2010  
**Dr. Donald J. Newman '54**, April 25, 2010  
**Dr. William P. Darrow '50**, May 11, 2010  
**Dr. Linda Munson '80**, May 13, 2010  
**Dr. Vincent E. McKenna '50**, May 22, 2010  
**Dr. M. Herbert Jones '51**, May 23, 2010  
**Dr. Albert C. Fritz '57**, June 2, 2010  
**Dr. Simeon L. Ross '50**, June 3, 2010  
**Dr. Alvin Eugene Hixon '50**, June 14, 2010  
**Dr. Frederick A. Erb '44**, June 29, 2010  
**Dr. David T. Berman '44**, July 8, 2010  
**Dr. James J. Flannery '52**, July 16, 2010  
**Dr. Charles E. Hall '53**, July 29, 2010  
**Dr. Isidor Yasgur '49**, August 3, 2010  
**Dr. Kenneth P. Seeber '68**, August 23, 2010  
**Dr. DeWitt T. Baker '44**, September 3, 2010  
**Dr. Fernando de Noronha, Emeritus professor**, September 11, 2010  
**Dr. Richard K. Zeitel '62**, September 28, 2010  
**Dr. Robert S. Doig '43**, October 1, 2010  
**Dr. George W. "Bud" Wicks '50**, October 4, 2010  
**Dr. Albert E. Grass '52**, November 13, 2010  
**Dr. Jeffrey A. Friedman '79**, November 21, 2010  
**Dr. John Francis "Hoke" Hokanson '43**, December 8, 2010  
**Dr. Stephen B. Hitchner, Emeritus professor**, January 1, 2011  
**Dr. Kenneth W. Benson '48**, January 2, 2011  
**Dr. John Combs '62**, January 5, 2011  
**Dr. James Gillespie, Emeritus professor**, January 10, 2011  
**Dr. Robert Kirk, Emeritus professor**, January 19, 2011

and elk. Awarded a K01 Mentored Research Scientist Development Award from the National Institutes of Health and National Center for Research Resources for continued study of CWD transmission and pathogenesis. Accepted a Research Scientist position at Colorado State University.

## 2005

**Myrna M. Miller, PhD,**  
Laramie, WY

University of Wyoming Trustees with the College of Agriculture and Natural Resources faculty have appointed Myrna M. Miller to the position of assistant professor in the Department of Veterinary Sciences. Myrna received a B.S. (1980) and a D.V.M. (1984) from Colorado State University and a Ph.D. (2005) in veterinary medicine from Cornell University. Miller has been at the Arthropod-Borne Animal Diseases Research Laboratory since 2007.

## 2007

**Ann W. Johnson**  
(née Weinheimer), DVM, and  
**Gregory Johnson, DVM**, Perry, NY  
The Johnsons, who met at Cornell and later married, have been appointed associate veterinarians at the Perry Veterinary Clinic, PLLC. Ann is a companion animal clinician, while Greg is a mixed practitioner with primary interest in food/dairy animal and companion animal medicine. Ann attended Kenyon College before earning her DVM at Cornell. Following graduation she practiced at a veterinary specialty and emergency clinic in the Philadelphia area. Greg did his undergraduate and veterinary studies at Cornell and later practiced in both California and Philadelphia.

## 2009

**Allison C. Cooperman, DVM,**  
Rochester, NY  
The Perry Veterinary Clinic appointed Dr. Allison C. Cooperman associate veterinarian for the Companion Animal Service. She will be practicing at the clinic's Animal Care Facility of Livonia office. Cooperman received bachelor's and master's degrees from Columbia University and graduated from the Cornell University College of Veterinary Medicine.

**Lauren Sawchyn, DVM,**  
Danbury, CT

Lauren, who graduated from the Medical College of Georgia with a master's in medical illustration before completing her doctorate in veterinary medicine at Cornell, continues to prepare a feline dissection guide for publication with Cornell Anatomy Lecturer Dr. Paul Maza. Aside from her freelance illustration work, Lauren is a practicing clinician at a veterinary hospital in Ridgefield, CT, and pursues her dual passion for art and animals through her portfolio of watercolor paintings.

## 2010

**Kay N. Russo, DVM,**  
Stephenville, TX

Pfizer Animal Health and the American Veterinary Medical Foundation congratulate Kay Russo, the 2010 Food Animal Veterinarian Recruitment and Retention Pilot Program recipient. The program, which awards five chosen veterinarians with up to \$100,000 each in the form of student loan debt forgiveness grants, is designed to combat an ongoing shortage of food-animal veterinarians in the United States by encouraging more students to pursue a food-animal career, particularly in rural areas. The program will provide financial incentives for veterinarians who commit to four years of employment in food-animal practice.

**Erin Elizabeth Morgan, DVM,**  
Willimantic, CT

Erin Elizabeth Morgan, daughter of Evelyn and Bob Morgan of Willimantic, and Mathew A. Paugh, son of Darlene Barrows of Lansing, NY, and Edward Paugh of San Antonio, TX, announce their engagement. Erin is a 2002 graduate of Windham High School and received a bachelor's degree in 2006 and a doctorate in veterinary medicine this spring from Cornell University. She is currently doing an internship in large-animal medicine and surgery at the University of Guelph in Ontario, Canada. Mathew is a former sergeant in the U.S. Army infantry, with service in Iraq and Bosnia, and is currently employed by the New York Department of Transportation. An October 2011 wedding is planned.

# SHARE YOUR NEWS

We will include Class Notes in the July 2011 issue of 'Scopes Magazine. Please let us know what you'd like to share with your classmates in our Class Notes section by May 15, 2011, for inclusion.

NAME

(MAIDEN IF APPROPRIATE)

CLASS YEAR

ADDRESS

EMAIL

PHONE

Please tell my classmates that...

**PLEASE RETURN TO:** Cornell University, College of Veterinary Medicine, Box 39, Ithaca, NY 14853. Alternatively, share your information with us via email ([vetfriends@cornell.edu](mailto:vetfriends@cornell.edu)) or complete the online form at [www.vet.cornell.edu/alumni/ClassNotes](http://www.vet.cornell.edu/alumni/ClassNotes).

## Book your hotel today for Reunion: June 9–12, 2011

Blocks of rooms have been reserved at these hotels. (Be sure to mention that you are with the College of Veterinary Medicine and your DVM class year.)

**Best Western:** Pet friendly. 607.272.6100  
[www.BestWesternUniversityInnIthaca.com](http://www.BestWesternUniversityInnIthaca.com)

**Courtyard by Marriott:** 866.541.3600  
[www.marriott.com/ithcy](http://www.marriott.com/ithcy)

**Econo Lodge:** Pet friendly. 607.257.1400  
[www.econolodge.com/hotel/ny127](http://www.econolodge.com/hotel/ny127)

**Hampton Inn:** 607.277.5500  
[www.Ithaca.HamptonInn.com](http://www.Ithaca.HamptonInn.com)

**Homewood Suites:** Pet friendly. 800.callhome  
[www.Ithaca.HomewoodSuites.com](http://www.Ithaca.HomewoodSuites.com)

**La Tourelle:** 607.273.2734  
[www.LaTourelle.com](http://www.LaTourelle.com)

**Ramada Inn:** 607.257.3100  
[www.ramadainnithaca.com](http://www.ramadainnithaca.com)

**Super 8:** 607.273.8088 [www.super8.com](http://www.super8.com)

**On-campus housing:** Cascadilla Hall;  
Contact Paula Aiken (607.253.3716/[psa2@cornell.edu](mailto:psa2@cornell.edu)).

**FOR REAL-TIME UPDATES:**  
[www.vet.cornell.edu/alumni/reunion](http://www.vet.cornell.edu/alumni/reunion)



# Reunion

Then. Now. Always. CORNELL



# Marking a milestone

## THE COLLEGE OF VETERINARY

**MEDICINE** and the College of Veterinary Medicine Alumni Association honored 81 students in the Class of 2012 at the White Coat Ceremony in December 2010. White coat ceremonies have become a tradition at many schools of medicine and at veterinary colleges across the country. At these ceremonies, students receive the ultimate symbol of professionalism and empathy in the practice of medicine – the white coat.

“The white coat ceremony marks the transition of students from learning the language and scientific basis of medicine to learning the art and science of the delivery of medicine,” said Dr. Michael I. Kotlikoff, dean of Cornell’s College of Veterinary Medicine.

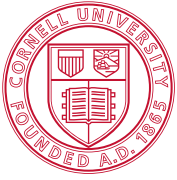
Cornell adds special meaning to this “rite of passage” in two ways. During the ceremony, veterinarians and faculty who have provided mentorship to students along the way are asked to participate in the ceremony by enrobing their students. Similarly, family and friends who have provided considerable support and special encouragement are asked to pin their student.

Dr. Tsegaye HabteMariam, dean of Tuskegee University’s College of Veterinary Medicine, Nursing, and Allied Health, offered the keynote address, urging students to combine passion with compassion for a successful career.

In closing, Kotlikoff addressed friends and family in the audience: “Following our ceremony today, these pristine white coats

will get a little dirty as our students take over as the front line for patient care in our hospitals and ambulatory service. Our budding clinicians will stay up all night with patients, wrestle cows and recover horses, answer endless probing questions from clinicians and owners, and learn to live without much sleep or with a phone by the pillow. Through this time-honored process they will experience for the first time, and in a measured way, what it means to have primary responsibility for the health and well-being of patients. So please, try to cut them a little slack, because we’ll cut them very little.”





**Cornell University**  
**College of Veterinary Medicine**

Box 39  
Ithaca, NY 14853

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Just completed in September of last year, the New York State Veterinary Diagnostic Laboratory facility is the newest addition to the College campus, but represents a long time partnership between the College and the State. Part of the overall Animal Health Diagnostic Center, it provides the critical regulatory testing and surveillance services needed to protect animal and human health, safeguard the food supply and support one of the major pillars of the state's economy, animal agriculture.

