In this issue of Profiles

Research

• Affecting entire systems: veterinary public health and food safety
• Animal models of human disease
Fall has arrived, and with it come the challenges of a new academic year and the excitement of a new class of veterinary students. While much of the work of a new academic year focuses on our students, a wealth of knowledge is being gained outside the classroom in research labs throughout the College. Research and scholarly pursuits are essential activities for CVM faculty, staff, residents, interns, and students.

At the CVM, we take great pride in our pursuit of discovery, and I am excited to share this issue of Profiles with you. It features some of our notable research projects. I am particularly pleased to share articles that offer examples of research guided by “one medicine, one science,” which recognizes that the health of animals, humans, and the environment are intertwined. Our research efforts are organized around three signature programs: comparative medicine, emerging and zoonotic diseases, and population systems.

One of my goals when I became dean in 2008 was to develop a five-year strategic plan for research, which we completed last fall. Our strategic plan set bold new priorities for our research programs in the key areas discussed above. While it is clear that the future of the College rests on our ability to perform cutting-edge science that will help our state and nation, we also recognize that to accomplish our research goals, we must continue to invest in our research infrastructure as technologies and scientific methods continue to evolve at an ever-increasing rate. I am also delighted to note that even during these financially challenging times, our research funding is on the rise. The College is now ranked sixth—up from ninth—in research funding by the Association of American Veterinary Medical Colleges. And this standing does not reflect the $185 million grant the College and its partners were awarded by the United States Agency for International Development cooperative agreement.

In this issue of Profiles, you will learn how our investigators are conducting basic, translational, and clinical cutting-edge research, as well as investigating new educational methodologies. The research we conduct will be used to transform clinical practice, veterinary education, and animal health and food safety. Our Profiles stories will also give you a clear picture of how CVM research fulfills the College’s mission to improve the health of animals, people, and the environment—not only in Minnesota but also in the nation and the world.

As we continue our pursuit of research excellence, these programs will also continue to be an essential component supporting the education of veterinary medical students and graduate students within the College and the University at large. I hope you enjoy reading about our research programs as much as I have.

With warm regards,

Trevor Ames, D.V.M., M.S., Diplomate ACVIM
Dean
In this issue

Features

4 Animal Models of Human Disease
Comparative medicine is leading to new treatments for a host of conditions shared by humans and companion animals.

10 Affecting Entire Systems
Pioneers in food safety, population systems researchers not only discover and disseminate new knowledge, but train tomorrow’s leaders and meet the needs of external stakeholders.

13 College is Home to Homeland Security Center of Excellence
The National Center for Food Protection and Defense has a staff of 10 and a national network of hundreds.

14 Summer Scholars Get Hands-on Research Experience
The Summer Scholars Program gives first- and second-year veterinary students first-hand experience in research.

15 Researchers Honored at Annual Research Day Event
The College’s annual Points of Pride Research Day included seminars, award presentations, and a record number of poster presentations.

Insert CVM Research and Discovery Timeline
College of Veterinary Medicine research milestones, 1947-2009

18 First Veterinarians Receive Funds From Loan Forgiveness Program
Three veterinarians have now received funds from the hard-won Minnesota Rural Veterinarian Loan Forgiveness Program. Meet two of them, Dr. Jason Anderson and Dr. Mackenzie Jones.

20 Private Funds Back College Investment in eLearning
Thanks to private dollars from CVM alumni, the College is making a major investment in eLearning.

In every issue

21 Graduate Program News
23 Around the College
25 Faculty and Staff News
27 Student News
28 Advancement
32 Mark Your Calendar

On the cover
Veterinary public health resident Michael Mahero takes a sample from a vegetable bin as part of his research on agricultural practices on vegetable farms. See story on page 10. Photo by Sue Kirchoff
Animal models of Human disease
Most people who live with companion animals are well aware of the simple health benefits their four-legged friends provide. Petting cats, for example, can lead to lowering of blood pressure, and dog walking can aid cardiovascular health. Scientists are also discovering, however, that these animals can provide additional benefits to human health and medicine through an area of research called comparative medicine. This growing field is leading to breakthroughs in medical and veterinary treatments for a host of naturally occurring conditions shared by humans and companion animals.

“Historically, research to benefit human medicine was done in rodents, and disease was induced,” says Srirama Rao, associate dean for research at the College of Veterinary Medicine. “Today, companion animals are developing diseases very similar to what we see in humans, and increasingly there is recognition that companion animals are more representative and appropriate animal models of human conditions.” Diseases common in both humans and companion animals include epilepsy, atopic dermatitis, cancer, asthma, arthritis, and obesity-related diseases such as diabetes and cardiovascular conditions. With better access to care, companion animals are also living longer and developing human-like geriatric diseases such as heart failure.

Owners of companion animals that suffer from diseases also seen in humans are becoming increasingly receptive to involving their pets in clinical trials research. With informed owner consent, veterinarians can study the origin and progression of disease while developing safe and effective veterinary treatments—often customized to the patient. The same information may then be applied to the diagnosis and treatment of human disease. This has the overall effect of reducing the time it takes to move a new therapy toward approval by the Food and Drug Administration.

New breakthroughs in the fields of genomics and proteomics have helped facilitate the understanding of the mechanisms of disease, which in turn has advanced the field of comparative medicine.

“The recent advent of translational medicine provides the College with an additional opportunity to test cell, small-molecule, and gene therapies in animal models of human conditions,” notes Rao. “The College of Veterinary Medicine is poised to take a big leap forward in understanding diseases that affect humans and animals alike.”

**Brain cancer**

One of the University’s most highly publicized comparative research projects is a joint effort between John Ohlfest, head of the neurosurgery gene therapy program at the Masonic Cancer Center, and Liz Pluhar, associate professor of surgery at the College of Veterinary Medicine. The two have made great strides in the treatment of gliomas in dogs and are now applying their work to other forms of brain cancer.

Two years ago, Ohlfest and Pluhar developed a combination treatment protocol that consists of first surgically removing the brain tumor, then treating the surgical site with gene therapy to attract immune cells that can recognize and destroy remaining tumor cells, and finally administering an anti-cancer vaccine made from the dog’s own cancer cells to prevent tumor recurrence.

“The average life expectancy for a dog with a glioma is 28 days without treatment,” says Pluhar. For dogs that receive surgery alone and survive, life expectancy increases to two, maybe three, months. In clinical trials, the median survival rate of dogs with gliomas undergoing the experimental gene therapy is six to eight months post-treatment.

Currently Pluhar is overseeing five clinical trials. Three involve dogs with surgically accessible gliomas, the fourth is for dogs with non-accessible gliomas, and the fifth is for dogs with accessible meningiomas. The newest of the trials involves seven dogs with high-grade accessible gliomas.

“Those dogs are doing very well,” says Pluhar. “Follow-up brain scans (MRIs) at two months are disease-free, but it’s still early in the therapy.”

Pluhar and Ohlfest have received funding from the American Cancer Society, National Institutes of Health, American Brain Tumor Association, and Randy Shaver Cancer Research and Community Fund. They currently have enough funding to accept another 50 or 60 dogs into clinical trials.

Ohlfest is now recruiting people with gliomas for a phase-one clinical trial, and collaborators at the University of California, Los Angeles, will soon start their own human trial using the new gene therapy protocol.

“There is the potential for this type of therapy to be used on nearly any type of systemic cancer in dogs, not just brain cancer,” says Pluhar. She and Ohlfest are now using their combination gene therapy to treat a dog with osteosarcoma (bone cancer). Their groundbreaking work will be featured on “Survivor Tales,” a television series produced by the Foundation for Biomedical Research for local broadcast.

**Epilepsy**

Drs. Ilo Leppik and James Cloyd of the College of Pharmacy were looking for an animal model to determine whether intravenous injections of the drug levetiracetam could be used as an emergency treatment for epilepsy in humans, when they contacted Ned Patterson, assistant professor of medicine.

Patterson’s work is another example of the power of comparative medicine. Intravenous levetiracetam is approved as a treatment in humans when oral medications aren’t possible, such as the night before surgery or when someone is unable to keep oral medication down. But it has not been approved for routine emergency use in humans and it was not being used in veterinary medicine when Leppik and Cloyd approached Patterson.

Dr. Liz Pluhar examines a patient in one of her clinical trials. Her research on dogs with brain cancer may benefit humans as well as dogs. Photo by Sue Kirchoff
“One to five percent of dogs and one to two percent of people develop recurrent seizures, which is the definition of epilepsy,” says Patterson. “Epilepsy exists in all species, but it is most common in dogs and humans.” Thirty percent of dogs with recurring seizures do not respond well to one or more drugs in current use, and 20 to 40 percent of severely seizuring dogs brought to veterinary hospitals do not survive.

Before undertaking a clinical trial to test levetiracetam’s use as an intravenous emergency treatment in dogs, Patterson tested the drug’s safety by giving it as an intramuscular and intravenous injection. Once safety was established, he then conducted a controlled study using the drug intravenously to treat dogs in severe seizure that were brought to the Veterinary Medical Center.

Patterson, who will present his findings at the American Epilepsy Society’s meeting in San Antonio, Texas, in December, says levetiracetam as an emergency intravenous treatment in dogs “looks promising for safety and effectiveness.” His work could lead to similar clinical trials in humans—exactly what Leppik and Cloyd had hoped would happen.

**Dermatitis**

Sheila Torres, associate professor of dermatology, completed a study looking at the expression of ceramides in the skin of dogs with atopic dermatitis.

“Ceramides are important for normal skin barrier,” Torres notes. “They help prevent the introduction of environmental allergens and microbes into the skin.” Earlier work in human medicine and Torres’ recent study show both dogs and humans with atopic dermatitis have reduced expression, or formation, of these lipids in their skin. Her work provided evidence that topical medications to replace ceramides in skin can benefit these dogs.

Torres and Mark Rutherford, associate professor of veterinary and biomedical sciences and associate dean of graduate programs, are now investigating the validity of using the dog as a model for human medicine when looking at reduced expression of peptides in the skin.

“Defensins are very small peptides naturally expressed in the skin and other organs in a variety of species—including people, dogs, pigs, and cows—that protect against infectious organisms, including bacteria, viruses, and fungi,” Torres explains. “We have already shown that the normal skin of dogs expresses these peptides.”

The research team is now conducting a controlled clinical study to see whether the skin of dogs with atopic dermatitis has a reduced expression of defensins, which would explain these dogs’ predisposition to developing skin infections.

“We hope to develop novel treatments that could have a significant impact on managing the disease,” says Torres. “But it’s still too early to know.”

**Arthritis**

Michael Conzemius, professor of veterinary surgery, has been exploring the use of stem cells to reduce inflammation in arthritic joints in dogs for the past six years. Historically, the bulk of research in this area has been with autogenic stem cells, which are harvested from a patient and then given back to the patient either through an injection into the joint or intravenously to achieve a systemic effect.

Conzemius recently started to work with allogeneic stem cells, or stem cells harvested from patients undergoing routine surgical procedures, through a grant provided by the Veterinary
Orthopedic Society. He then cultures and tests the cells to find those that have the greatest anti-inflammatory effect.

“We have already shown that not all cells are equal,” Conzemius says.

After selecting the cells with the greatest potential to reduce inflammation, Conzemius deep-freezes them for use in an investigational project.

“The purpose of the study is to find evidence of the safety and efficacy of using allogeneic cells to treat dogs with lameness caused from arthritis,” Conzemius notes. If proven effective, allogeneic canine cells could be given to any dog regardless of breed, which would provide several benefits. First, a patient wouldn’t need to undergo an anesthetic procedure for stem-cell harvesting. Second, when a patient arrived at the hospital, the cells, which would have been thawed and suspended in a saline solution, would be ready to be given. And, finally, the patient would receive tested cells selected for maximum efficacy.

Similar work is being conducted in human medical research, but many questions remain.

“That’s why we are doing a comparative model,” says Conzemius. “We will then have a naturally occurring model that we can use for translational research.”

Clinical Investigation Center: a resource for researchers

Many clinical researchers at the College of Veterinary Medicine rely on the College’s Clinical Investigation Center (CIC), which provides scientific and clinical expertise, facilities, technical staff, and overall study coordination. The CIC staff provides a single point of contact for faculty, coordinating research projects from proposal to final report.

Research sponsors include business and industry, foundations, the Food and Drug Administration (FDA), and National Institutes of Health (NIH). As of November, the CIC was recruiting participants for 13 ongoing clinical trials in behavior, dermatology, emergency medicine, internal medicine, oncology, orthopedics, and urology.

Dr. Mike Conzemius, who was appointed director of the CIC in May, has more than 15 years experience executing FDA, NIH, and veterinary clinical research projects.

“With a committed sponsor, we can have a project up and running in 45 days or less,” he says. “Preexisting budget, contract, and protocol forms allow for smooth negotiations, and access to faculty experts in nearly every specialty, a large technical staff, and nearly 40,000 clinical cases per year allow for proficient study design and execution. Our vision for the CIC is to be the premier veterinary research center for clinical trials in the United States.”

To learn more about the CIC, visit www.cvm.umn.edu/cic/.
Modiano and team study golden retrievers and cancer
Findings may aid in diagnosis and treatment of cancer in dogs and people

Jaime Modiano, Perlman Endowed Chair of Comparative Oncology and director of the Animal Cancer Care and Research program, has teamed up with other canine cancer scientists and two animal health foundations to find out why golden retrievers are highly susceptible to cancers arising in the blood, lymphatic, and vascular systems. The scientists believe their findings will benefit dogs as well as humans because the genes involved in cancer are often the same in dogs and people.

This three-year project began in September with funding from a $1 million grant from the Golden Retriever Foundation and Morris Animal Foundation. The goal: to identify the genes and describe the genetic changes that lead to about one in five golden retrievers getting hemangiosarcoma, a rare, rapidly growing cancer of the cells that form blood vessels, and about one in eight golden retrievers contracting lymphoma, a cancer of a part of the immune system called the lymphatic system.

The scientists leading the project represent the top canine cancer researchers in the world: Modiano, professor of oncology and comparative medicine with the University of Minnesota’s College of Veterinary Medicine and Masonic Cancer Center; Matthew Breen, professor of genomics at North Carolina State University and genetics researcher at the University of North Carolina’s Lineberger Comprehensive Cancer Center; and Kerstin Lindblad-Toh, director of the Vertebrate Genome Biology Program at the Broad Institute and professor of comparative genomics at Uppsala University in Sweden.

"Cancer is the number-one disease that can occur spontaneously in both dogs and people," says Modiano. "Because dog breeds are controlled through breeding, because the dog genome is so similar to the human genome, and because dogs are comparable in size and weight to humans, we can study different types of cancer faster in dogs and more readily apply our findings to people. So in this case, what we learn about hemangiosarcoma and lymphoma in golden retrievers could be accurately translated into greater understanding and better treatment of comparable diseases in people."

Besides identifying genes linked to the two cancers, the scientists aim to determine why golden retrievers are predisposed to the cancers, how the risk could be reduced, and whether DNA tests could aid in diagnosis and treatment. They also will study the mutations that occur in the tumors and their susceptibility to...
Funding of translational research is key to success

In addition to gifts from private donors, the University is seeking grants from the National Institutes of Health (NIH) that could fund comparative medicine and cutting-edge translational research for years to come. Comparative medicine, the study of animal biology and disease for the purpose of applying the results to the diagnosis and treatment of animal and human disease, has placed the College of Veterinary Medicine in a very strategic position.

“We have the largest and most diverse clinical caseload of any veterinary teaching hospital in the United States,” notes Robert Washabau, chair of the Veterinary Clinical Sciences Department and a co-lead of the comparative medicine signature program. That gives the College an additional strategic advantage because animals that share biological similarities with humans provide excellent models of human disease.

The University of Minnesota, Indiana University, Purdue University, and Eli Lilly and Company have entered into a collaborative research agreement to support translational studies that utilize animals—with the informed consent of their owners and for the potential benefit of the animal—as models of human disease. The collaboration is supported by the Clinical and Translational Science Institutes at the University of Minnesota and Indiana University. Each of the four collaborating partners has agreed to set aside $150,000 per year for five years to support research grant applications in comparative medicine and translational research.

The translational research strategy of more quickly moving therapies from lab bench to patient bedside or veterinary kennel has several unique advantages, according to Washabau. Naturally occurring, or spontaneous, disease states in companion animals offer a realistic approach to investigating therapies for similar disease states in humans. Chronic disease states in the dog, for example, are easily studied because the progression of these diseases takes place over a shorter period of time than in humans. And, finally, conducting phase I and II veterinary clinical trials prior to launching human trials could result in a significant cost savings for the human health industry.

The comparative medicine program brings together investigators from the University of Minnesota’s College of Veterinary Medicine, College of Pharmacy, School of Medicine, School of Dentistry, School of Public Health, College of Biological Sciences, and College of Food, Agriculture and Natural Resource Sciences.

Modiano awarded first translational medicine research grant

Jaime Modiano and his colleagues at the University of Minnesota, Purdue University, and the University of Pennsylvania were awarded the College’s first Veterinary Translational Medicine research grant in September for the study “Ablation of tumor initiating cells by P-glycoprotein inhibition: Proof of principle in canine diffuse large B-cell lymphoma.” The investigators were awarded a grant of $228,835.

Modiano and his team propose to determine the extent to which P-glycoprotein inhibition leads to elimination of tumor-initiating cells. Read more at www.cvm.umn.edu/newsarchives/2010/translationalmedicine.
The health and well-being of poultry and livestock as well as the practices of those who grow and raise our food directly affect the safety of what has become a global food system. The College of Veterinary Medicine has been a pioneer in the realization that traditional practices used to mitigate infectious diseases in livestock, such as vaccinations and modifying animal flow strategies, cannot keep pace with the continual evolution of emerging and re-emerging pathogens. Population systems, one of the College’s signature programs, not only discovers and disseminates new knowledge through research, but trains tomorrow’s leaders and meets the needs of external stakeholders.

Discovering and disseminating new knowledge on livestock health is critical to ensuring that the food system remains free of pathogens and Minnesota producers remain competitive in today’s global marketplace. Scott Dee, professor of swine medicine, discovered in earlier research that the porcine reproductive and respiratory syndrome (PRRS) virus can be transmitted via air for at least 5.6 miles. Now he’s investigating ways to prevent airborne virus from entering pig production operations.

Historically, veterinarians cleaned up herds infected with PRRS by halting the introduction of new animals for up to 10 months, but the risk still exists that a cleaned-up herd will become infected with an outside virus.

“The PRRS virus mutates very quickly, and it’s difficult to create new vaccines that provide cross-protection against all strains,” says Dee. “Therefore, we need to develop ways to reduce the risk of herds becoming infected.”

Dee tested the use of commercial air filters to prevent the PRRS virus from entering a swine building at the Swine Disease Eradication Center’s research site in west-central Minnesota. He showed that commercial filters, when installed in the air-intake units of buildings housing susceptible populations, can act as a barrier to the virus and prevent infection via the airborne route. Three veterinary clinics in southern Minnesota are now field-testing the filters, comparing results from filtered herds with those from non-filtered herds over the course of four years.

Researchers at the College are also looking at bovine tuberculosis, both in the
lab and in the field. Srinand Sreevatsan, associate professor of infectious disease, is using functional genomics and proteomics to discover how *Mycobacterium*, the causative agent in bovine tuberculosis, survives in the environment and enters the host, as well as how the host responds. He hopes his findings will eventually lead to an early detection test.

“The vision is to make this test a simple milk- or serum-based test to detect biomarkers,” Sreevatsan says. “I already have identified several biomarkers associated with bovine tuberculosis and am currently analyzing them. I hope to have a set of validated markers for evaluation by federal agencies early next year.”

Bovine tuberculosis, which is transmitted through saliva, manure, urine, and milk, is not a major food-safety issue in the United States, but it is elsewhere in the world and could become a concern here if left uncontrolled. Identifying animals early in the infection cycle can prevent spillover of this bacterium into the food supply. Bovine tuberculosis also creates a public health threat for livestock producers, slaughter plant workers, and others who come into direct contact with infected animals.

Minnesota was free of bovine tuberculosis from 1971 until 2005, when it was detected in a cattle herd. Since then, 12 herds and 27 free-ranging, white-tailed deer in northwestern Minnesota have tested positive. Scott Wells, professor of veterinary population medicine, recently conducted a study in collaboration with the U.S. Department of Agriculture Animal and Plant Health Inspection Service’s Wildlife Services, Minnesota Board of Animal Health, and Minnesota Department of Natural Resources to assess the risk of deer-cattle interactions at 50 farms near the infected area. The study, which looked at feed, water, and other potential sources of transmission, showed a high frequency of deer-cattle interactions, especially involving cattle feed, that could potentially allow *Mycobacterium* to pass between animals through saliva and respiratory secretions.

The research team’s next step was to evaluate the effectiveness of one method that could be used to reduce these interactions. The team first placed hay bales in open test sites in northern Minnesota. These hay bales attracted 100 deer hits per day. The researchers then installed portable battery-powered electric fences around half the test sites and found that electrified fences can reduce deer predation of hay, but not to zero risk.

One of their next steps will be to monitor the activity, seasonal movements, and habitat use of radio-collared deer to learn how likely they are to visit cattle feed storage areas and what practices keep them out. Once Wells and his collaborators better understand transmission risks, they will use that knowledge to evaluate optimal ways to detect infected cattle herds.

**From pioneers to tomorrow’s leaders**

The College’s food-safety pioneers are also training tomorrow’s leaders. The Center for Animal Health and Food Safety (CAHFS) offers a veterinary public health residency program, which allows early- to mid-career veterinarians to gain specialized training in veterinary public health at a time when emerging zoonotic diseases and food-borne illnesses often dominate headlines. The veterinary public health residency program is also offered as a dual-degree program through the University’s School of Public Health, which offers a master’s of public health degree.

Over the course of the program, veterinary public health residents are assigned to a variety of research projects that can be local to international in scope. These projects often are multi-disciplinary, involving public/private partnerships with industry, livestock producers, vegetable growers, food safety regulators, and policy makers.

“A lot of attention is being given to Shiga toxin-producing *Escherichia coli*, a group of bacteria strains transmitted primarily through contaminated food, causing bloody diarrhea,” says Jeff Bender, director of CAHFS and associate professor of veterinary public health.

Veterinary public health and dual-degree students interested in researching how Shiga toxin-producing *E. coli* moves from...
farm to fork, for instance, might visit vegetable farms to see whether current production practices are well-designed to prevent transmission, or tour dairy and beef operations to understand transmission issues related to the livestock sector. Other students study entire food systems, from farm to fork, to determine where along the chain a breakdown has or might occur.

Veterinary public health resident Karin Hamilton recently worked with Bender to study the extent that vegetable producers in Minnesota understand and practice good agricultural practices known as GAPs.

“We found that many of them are lacking in paperwork and documentation on training because their employees are often family members,” Hamilton says. “But most farms were using well water and not pond water or other potentially riskier water sources for irrigation or washing vegetables.”

Once these farms are evaluated, the researchers can then let them know what practices the operations are doing well and which could be improved upon.

CAHFS also participates in and provides seed money to encourage multidisciplinary research into emerging diseases. Increasing interactions among humans, livestock, poultry, and wildlife have resulted in the emergence of zoonotic diseases, including avian and swine influenza viruses. One of CAHFS’ ongoing involvements in this area is through the International Cooperative Zoonotic Influenza Research Center (ICZIRC), which is funded by the Centers for Disease Control and Prevention. ICZIRC’s overarching goal is to better understand influenza viruses and the threat they pose to human health.

Collaborating partners include Chulalongkorn University in Thailand, University of Iowa Center for Emerging Infectious Diseases, Vaccine Research Group, Mayo Clinic College of Medicine, Minnesota Department of Health, and the Marshfield Clinic Research Foundation. Samples are being tested at Chulalongkorn University, Minnesota Department of Public Health Laboratory, University of Iowa, and the University of Minnesota Veterinary Diagnostic Laboratory, including those collected from pigs, poultry, migratory waterfowl, and humans. ICZIRC partners are also collecting data on management practices from owners of backyard poultry flocks in Minnesota, Wisconsin, and Thailand, as well as from people working with swine in Minnesota and Iowa. Through analysis of these data, ICZIRC is looking at how people are exposed to and infected with avian and swine influenzas and exploring practical ways to prevent transmission of these diseases.

“Public/private partnerships not only provide a rich experiential learning environment but also meet the College’s service mission,” says Bender.

Three signature programs

Research in the College of Veterinary Medicine is guided by “one medicine, one science,” which recognizes that the health of animals, people, and the environment are intertwined. The College’s research efforts are organized around three signature programs: comparative medicine, population systems, and emerging and zoonotic diseases.

Comparative medicine
Comparative medicine and animal models of human disease are crucial to the advancement of medical knowledge in veterinary and human medicine. The comparative medicine program emphasizes interdisciplinary and collaborative research with investigators from throughout the College, Academic Health Center, University, and other organizations around the world. This signature program has three focus areas: oncology and cancer biology, inflammatory and chronic diseases, and molecular and genetic models of human disease.

Population systems
The population systems signature program has three focus areas—ecosystem health, livestock health, and global food systems—that examine the intersections of wildlife, food safety, and public health at a population level.

Emerging and zoonotic diseases
This signature program advances basic understanding of the pathogenesis of emerging and zoonotic diseases and develops novel and targeted surveillance systems, new diagnostic reagents and tests, and new vaccines and therapeutic agents to treat and prevent emerging and zoonotic diseases.

For more information about the College’s signature programs, visit www.cvm.umn.edu/research.
College is home to Homeland Security Center of Excellence

Tucked away on the first floor of the College of Veterinary Medicine’s Veterinary Science building is a Homeland Security Center of Excellence, the National Center for Food Protection and Defense (NCFPD).

Directed by Shaun Kennedy, assistant professor in the Veterinary Population Medicine Department and director of partnerships and external relations for the College, NCFPD was officially launched as a Homeland Security Center of Excellence in 2004. The multidisciplinary coalition of researchers addresses the vulnerability of the nation’s food system to attack through intentional contamination with biological or chemical agents.

NCFPD has a staff of just over 10 and a national network of hundreds. More than 150 experts from higher education, private-sector research, professional organizations, state and federal government agencies, and the food industry are involved in NCFPD's research and education programs. Academic collaborators include the University of Minnesota, Michigan State University, University of Wisconsin-Madison, North Dakota State University, Georgia Institute of Technology, and investigators from over 30 other universities and national laboratories. Nearly all NCFPD research and education projects involve students and research trainees.

A Princeton University graduate, Kennedy is a former international corporate executive with Ecolab and Proctor & Gamble. In 2003, he joined the College’s Center for Animal Health and Food Safety as associate director, immersing himself in global food safety and protection issues. NCFPD’s director emeritus and senior science advisor is Francis F. Busta, a University of Minnesota professor emeritus of food microbiology.

NCFPD takes a comprehensive, farm-to-table view of the food system, encompassing all aspects from primary production through transportation and food processing to retail and food service. Its research and education program is aimed at reducing the potential for intentional contamination or disruption at any point along the food supply chain and mitigating the potentially catastrophic public health and economic effects of such attacks. The program incorporates cutting-edge research across a wide range of disciplines, including supply chain management, logistics, epidemiology, risk assessment, economics, molecular biology, food microbiology, biomedical engineering, toxicology, and risk communication.

In delivering on its mission to defend the safety and security of the food system through research and education, NCFPD places a high priority on addressing potential threats to the food system that could lead to catastrophic damage to public health or the economy.

Research teams and capabilities
Forty-five research and education projects, based on collaborative efforts across multiple teams and organizations, are currently underway in these areas:

- **Behavior of biological and chemical agents.** Developing innovative detection, decontamination, and inactivation technologies based on the fundamental behaviors of chemical or biological threat agents in food.

- **Modeling possible food contamination event.** Developing dynamic, real-world models of food contamination events and public health responses, with the goal of identifying possible sources of contamination, food distribution points, and outbreak locations.

- **Systems strategies.** Establishing innovative prevention, response, and
Summer Scholars get hands-on research experience

Now in its ninth year, the College’s Summer Scholars Program gives first- and second-year veterinary students the opportunity to gain first-hand experience in research planning and implementation, data evaluation, and working effectively in an active research lab.

Interested students compete for the positions by submitting grant applications. Those selected work full-time under the direction of a research faculty mentor on a specific research project starting at the end of the spring semester. The program ends in August, when each scholar submits a written report to the Summer Scholars program office. In September, the students present posters at the College’s annual Research Day event. Summer Scholars participate in weekly seminars during the summer and are encouraged to take part in additional research seminar programs during the school year.

Summer Scholars develop leadership and teamwork skills, network with research professionals at state and local governmental agencies, take seminars that develop communication and critical-thinking skills, and develop an understanding of clinical and basic research as a potential career path. They also receive a $5,200 stipend and attend the Merck-Merial Summer Research Symposium at North Carolina State University. The College’s 2010 Summer Scholars, their mentors, and projects were:

- **Mike Lilla**, class of 2012. Mentor: Mike Murtaugh. Project: maternal transmission of porcine circovirus type 2 from sow to piglet.

The Summer Scholars program is funded by the College of Veterinary Medicine with support from Merial and Boehringer Ingelheim.

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To learn more about NCFPD, visit www.ncfpd.umn.edu.

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Shaun Kennedy conducts an advanced workshop for visitors from Peru and Thailand. Photo by Nick Hanson.
Researchers honored at annual Research Day event

Researchers were honored at the College’s annual Points of Pride Research Day event on September 29, which included poster presentations, seminars by the Distinguished Research Alumnus and Pfizer Research Excellence award winners, award presentations, and a reception. Summer Scholars, post-docs, technicians, residents, and graduate students presented a record number of posters—84—and a standing-room-only crowd packed Pomeroy Student-Alumni Learning Center for talks by Dr. Stephanie Valberg and Dr. Michael T. Collins.

Distinguished Research Partner:
Morris Animal Foundation. The award was accepted by Patricia Olson, president and chief executive officer.

Poster competition awards
- Summer Scholars: Jill Schappa
- Post-doctoral: Nooshin Bahai
- Comparative medicine: Josephine Gnanandarajah and Chunmei Long
- Emerging and infectious disease: Abirami Kugadas
- Population medicine: Joao Lima

Research Day celebrates the advances made in CVM laboratories and clinics, in the field, and on the farm. Posters highlighted research across the College in areas critical to solving problems in Minnesota, across the country, and around the world, including infectious diseases, ecosystem health, livestock health, food safety, and animal models of human disease.

“This event honors those individuals who spend so much of their time performing research within our College and our partners who make much of this research possible,” says Srirama Rao, associate dean for research.

Distinguished Research Alumnus Award: Michael T. Collins, professor, University of Wisconsin School of Veterinary Medicine. Collins’ research focuses on Johne’s disease.

Award presentations

Pfizer Research Excellence Award: Stephanie Valberg, professor and director of the Equine Center. A major focus of Valberg’s research is discovering the pathogenic and genetic basis for muscle disorders in large animal species. She was part of the international team of researchers that sequenced the equine genome.

Turkey genome sequence published
An international consortium of researchers, including Kent Reed, associate professor at the University of Minnesota College of Veterinary Medicine, has completed the majority of the genome sequence of the domesticated turkey. The sequence was published in PLoS Biology, a peer-reviewed open-access journal published by the Public Library of Science, in September.

In the short term, the genome sequence will provide scientists with knowledge of genes that are important in meat yield and quality, health and disease resistance, fertility, and reproduction. An improved understanding of genetic variation in turkeys may lead to development of new tools that producers can use to breed turkeys that have desirable texture, flavor, and leanness.

The genome sequence may also have applications in the biomedical field. Reed and another consortium member, for example, are studying the effects that aflatoxins have on turkeys. Aflatoxins are naturally occurring carcinogenic chemicals produced by fungi that suppress the immune system. The domesticated turkey is the most aflatoxin-susceptible species known.

Learn more at www.cvm.umn.edu/newsarchives/2010/turkeygenome.
College of Veterinary Medicine Research and Discovery Timeline 1947-2010

1947

- Veterinary Medicine. The first class consists of 24 students.

1949

- Brucellosis is virtually eliminated in dairy cows. By 1959, new diagnostic tests are developed for brucellosis, helping producers battle the disease.

1950s

- Findings lay the groundwork for uncovering causes of neurologic disorders in animals and people. These findings conduct experiments that link neurologic disorders to infectious agents.

1956

- Dr. William Hadlow conducts experiments that link neurologic disorders to infectious agents.

1963

- Researchers help develop the national Disease Reporting System of the U.S. Department of Agriculture.

1965

- The Minnesota Disease Reporting System is developed and validated by Drs. Stanley L. Diesch, Donald Johnson, Frank W. Martin, and L. Christensen. The system becomes the prototype for the national system.

1981

- The VDL becomes the first in the nation to provide diagnostic tests for avian disease.

1985

- The VDL develops a diagnostic test for aspergillosis, the most common fungal infection of birds at The Raptor Center.

2000

- Today, the orthopedic surgery and soft-tissue surgery services at The Raptor Center are the region’s most complete, offering care for birds at all stages of need - from minor fractures to more complex fractures and injuries.

2003

- Scientist Carrie Mahlum develops the first test to detect genetic markers for avian heart disease.

2004

- Dr. Sagar Goyal develops a vaccine to stop the spread of a parasitic disease in turkeys.

2005

- Dr. HanSoo Joo licenses Slectigen MJPRRS to MJ Biologics for the production of the first PRRS vaccine.

2007

- Dr. Vivek Kapur, director of the Advanced Genetic Analysis Center, leads a team of researchers to sequence the genome of Pasturella multocida, a bacterium that causes disease in poultry.

2008

- Dr. Stephanie Valberg discovers polysaccharide storage myopathy, a muscle disease in horses.

2010

- The VDL becomes one of the first veterinary hospitals in the country to offer 3-Tesla MRI imaging.

Not all CVM discoveries and milestones are represented.
First veterinarians receive funds from Minnesota Rural Veterinarian Loan Forgiveness Program

The Minnesota Rural Veterinarian Loan Forgiveness Program has now provided funding to three Minnesota veterinarians. Passed into law in 2009, the program aimed to recruit and retain food animal veterinarians to areas of need in Minnesota, providing funds for repayment of qualified educational loans for rural veterinarians. Three veterinarians have received awards; two are profiled here.

Jason Anderson, Class of 2009
Dr. Jason Anderson is with Harmony Veterinary Clinic, a five-doctor clinic in Harmony, a town of about 1,000 people in Fillmore County in southeastern Minnesota. The town bills itself as the "Biggest Little Town in Southern Minnesota" and is home to the largest Amish community in the state.

According to Anderson, Fillmore County has the densest population of beef brood cows in Minnesota, which also means there are a fair number of beef seedstock operations (purebred herds that provide breeding animals to other breeders and commercial producers). While the karst geology of the area limits the size of some of the production units, there are also a number of small- and medium-sized dairies, ranging from 40 to 750 lactating cows. The Amish community also needs veterinary services for their food-producing animals and horses.

The clinic treats food animals almost exclusively, with one veterinarian devoting a day and a half each week to small-animal appointments. About 85 percent of Anderson’s time is devoted to dairy and beef cattle, with the remainder spent on swine, equine, sheep, goats, and dogs and cats on emergency.

“The Minnesota Rural Veterinarian Loan Forgiveness Program greatly helps to correct the debt-to-income disparity facing food animal veterinarians,” says Anderson. “Veterinary school is expensive. . . The loan-forgiveness program helps lessen the burden and create a brighter financial outlook for food-animal veterinarians practicing in rural communities. And the benefit of the program to the state of Minnesota is tremendous—providing a strong impetus for food animal veterinarians graduating from the University of Minnesota to stay in Minnesota—because of the financial relief it provides.”

Mackenzie Jones, Class of 2010
Dr. Mackenzie Jones practices at Cottonwood Veterinary Clinic in Windom, Minnesota, a city of about 4,200 people in southwestern Minnesota. The clinic has mostly beef clients (cow, calf, and feedlot), as well as several dairy clients with herds of 15–400 cows. The clinic also serves a number of sheep clients, mostly commercial flocks and people raising show animals or breeding stock; a few meat goat clients, mostly hobby or small producers; and a handful of turkey and hog producers. They also see a fair number of horses. Jones is one of two veterinarians who do primarily large-animal work, while a third veterinarian primarily does small-animal work.

“The loan forgiveness program provides a great benefit to me and to the rural communities in Minnesota,” Jones says. “The loan forgiveness funds allow me to pay off my loans more quickly and to start saving for the future. Without the loan forgiveness funds, nearly all of my income would go toward loan payments and living expenses. The loan forgiveness program also provides rural areas in Minnesota with much-needed veterinary care. Producers rely on veterinarians to help them with management, herd health, and during emergency situations. By encouraging veterinarians to serve a
Education Day emphasizes excellence

The College of Veterinary Medicine held its first annual Education Day, celebrating the expertise and excellence in teaching within the College, at the Pomeroy Student-Alumni Learning Center on May 17. After a keynote address by Mark Hilliard of the University of Minnesota Medical School on engaging students to take responsibility for their own learning, faculty attended specialized sessions on eLearning, mentoring graduate students, and creative teaching techniques. Faculty members also presented posters and demonstrations related to education and educational methods.

“This is a way to show faculty how much we care about teaching here at the College of Veterinary Medicine, and we really wanted to have a special day to focus only on teaching,” says Laura Molgaard, associate dean for academic and student affairs.

“I was very appreciative of the strong support this initiative received at the state capitol and was thrilled to hear of the number and quality of practitioners and veterinary students who applied for this loan forgiveness funding,” says Trevor Ames, dean. “Clearly this demonstrates an important need.”

For Laura Molgaard, associate dean for academic and student affairs, the loan-forgiveness program is the perfect complement to the College’s VetFAST (Veterinary Food Animal Scholars Track) admissions program.

“We have been very pleased with the effectiveness of our VetFAST program to recruit highly qualified food animal students,” she says. “We are able to provide these students a state-of-the-art educational program to prepare them for food animal practice, but the missing piece had been a strategy to help deal with student debt. The Minnesota Rural Veterinarian Loan Forgiveness Program has been an important tool to address that challenge for qualified graduates.”

Despite its many benefits, the Minnesota Rural Veterinarian Loan Forgiveness Program may be a one-time program. The initial appropriation of $225,000, which provided funding for three veterinarians at $15,000 per year for five years, is now spoken for. While Ames and Molgaard are hopeful that the program will be funded again, they are concerned that funding may be hard to come by in these challenging economic times.

Dr. Mackenzie Jones cares for orphan lambs in Windom, Minnesota. Only days old, the youngsters needed treatment with fluids and antibiotics as well as encouragement to drink milk replacer.
Private funds back College investment in eLearning

Thanks to private dollars from CVM alumni groups, the College made a major investment in eLearning over the summer of 2010. A world-class “lecture-capture” system, with both fixed and portable components, is now part of the College’s teaching equipment. The systems directly “capture” or record the presenter’s slides, video, and voice for simulcast on the Web or for use in an online course.

The College’s three major lecture halls underwent equipment upgrades valued at nearly $90,000, which put the College of Veterinary Medicine on par with other units in the University of Minnesota Academic Health Center and other progressive veterinary colleges. This has major implications for all kinds of learners, from veterinary students to other people seeking science-driven, evidence-based veterinary medicine education modules around the globe. The Mather Lecture Series (an annual series of lectures on companion animal medicine) is an example of a lecture-based continuing education offering that is now part of the lecture-capture system. Mather Lectures are now simulcast on the Web once a month from September through June. Grand Rounds, the primary academic meeting at which new research findings are reported, will also be offered online on an asynchronous basis.

“Connecting online to our alumni through continuing education just became international,” says Alicia Johnson, director of continuing education, who is participating in the eLearning initiative. “Now everyone can attend cutting-edge lectures from one of the top 10 veterinary colleges in the world.”

Students are already raving about the new system. In an e-mail to Laura Molgaard, associate dean for academic and student affairs, Jen Gallus, class of 2012, wrote that she had recently missed an oncology lecture when she had to pick up her dog after surgery.

“I want to thank the College for investing in the lecture-recording system,” Gallus wrote. “It is fabulous! I hate missing class, but watched the lecture online.”

Success breeds success, and the College’s next milestone in eLearning and distance education was the acquisition of a $20,000 portable recorder for field capture. Under the leadership of Alumni and Friends Society board president Roy Martin, CVM alumni from 29 states stepped up to raise funds for the portable equipment. By August, $6,000 had been raised. In September, Intervet-Schering Plough contributed $10,000 to the fund, which was quickly topped off with additional donations to make the purchase.

“This new equipment will allow us to capture the broadest kind of ‘lecture,’ following the classroom to the field, the wet lab, and the hospital, where faculty and clinicians can create modules that cannot be taught in the lecture halls,” Johnson explains. “Teaching and learning is their expertise, and it no longer has to be confined to time and place.” The first offering will be a bilingual stock-handling course, capturing animal handling techniques in dairy barns and stalls to decrease stifle injuries. Recording will be done in English and Spanish.

The next eLearning endeavor will be the development of a fixed surgical-suite recording system to capture and produce surgical technique lectures and updates for new surgical procedures. The recording equipment will include macro capability for high-resolution close-ups.

Donations to the eLearning equipment fund are welcome at any level. For more information, contact Alicia Johnson, director of continuing education, at amj@umn.edu or 612-624-2268. Contributions to the fund can be mailed to Johnson at College of Veterinary Medicine, 1365 Gortner Avenue, St. Paul, MN 55108.

Discount for alumni association members

With another program launched in May 2010, eLearning and traditional continuing education courses come with an added benefit to alumni: University of Minnesota Alumni Association active members can receive 10 percent off any CVM continuing education course. Visit the Veterinary Continuing Education Web site at www.cvm.umn.edu/vetmedce/.
Degrees awarded to 15 graduate students

Fifteen graduate students received degrees this spring:

**Doctor of philosophy degree recipients**

- **Meggan M. Bandrick**, advised by Dr. Thomas Molitor. Thesis: Maternal Influences on Neonatal Immune Development
- **Lisa Anne Borgia**, advised by Dr. Stephanie Valberg. Thesis: Effect of Fat and Carbohydrates in the Diet of Horses with Polysaccharide Storage Myopathy and Equine Muscle Response to Underwater Treadmill Exercise
- **Kari J. Ekenstedt**, advised by Dr. James Mickelson. Thesis: Genetic Basis of Canine Neurological and Neuromuscular Diseases
- **Harish K. Janagama**, advised by Dr. Srinand Sreevatsan. Thesis: Studies on Iron Physiology of *Mycobacterium avium* subsp. *paratuberculosis*
- **Rebecca LaRue**, advised by Ruben Harris. Thesis: Dynamics of the Mammalian APOBEC3 Locus and the Relationship Between Mammalian APOBEC3 and Lentiviral Vif Proteins
- **Mary Jean Mauzy**, advised by Dr. Mark Rutherford. Thesis: Differential Analysis of the *in vitro* Transcriptome of *Cryptosporidium parvum*
- **Margaret A. McNulty**, advised by Dr. Cathy Carlson. Thesis: Histological Assessment of Osteoarthritis Lesions in Mice
- **Andrew M. Petzold**, advised by Dr. Stephen Ekker. Thesis: Development and Implementation of a Behavioral Based Nicotine Response Screen in Larval Zebrafish
- **Jeremy Schefer**, advised by Dr. James Collins. Thesis: Detection, Characterization, and Control of Bovine Viral Diarrhea Virus in Dairy Herds
- **Katherine R. Schiller**, advised by Dr. Scott O’Grady. Thesis: The Role of CFTR in the Regulation of Airway Epithelial Cell Migration

**Master’s degree recipients**

- **Luis Cruz-Martinez**, advised by Dr. Patrick T. Redig. Thesis: Spent Lead from Ammunition: A Source of Exposure for Bald Eagles
- **Alejandrina Da Silva Pita**, advised by Drs. John Deen and Peter Davies. Thesis: Evaluation of Sow Lameness and a Treatment
- **Shoko Toma**, advised by Dr. John Olhfest. Thesis: Effect of Oxygen on Tumor Cell Immunogenicity

The College’s graduate programs also welcomed 15 new graduate students into the M.S. and Ph.D. programs during the summer and fall terms. Of the 15 students, six are pursuing degrees in the comparative and molecular biosciences (CMB) program and nine are studying in the veterinary medicine (VMED) program. Three of the new VMED students are also residents in the Veterinary Medical Center and one CMB student is pursuing the D.V.M./Ph.D. dual degree. The Office of Graduate Programs held new student orientation on August 18, when new students were matched with current student mentors, met with their directors of graduate studies, and registered for classes.

The incoming students continue the international tradition of the College’s graduate programs: Eight countries are represented, including Brazil, Colombia, Egypt, Spain, Sri Lanka, Thailand, the United Kingdom, and the United States.

**Eva Furrow named Joanne Schmidt O’Brien/Bee Hanlon Fellow**

Dr. Eva Furrow has been named the Joanne Schmidt O’Brien/Bee Hanlon Fellow. This fellowship supports M.S. or Ph.D. training of a small-animal medicine resident. Furrow is working with her advisor, Dr. Ned Patterson, and Dr. Jody Lulich studying the genetics of calcium oxalate bladder stones in dogs. She plans to pursue a career in academic veterinary medicine.
Sam Maheswaran Graduate Fellowship in Food Animal Health welcomes contributions

In October 2009, the College of Veterinary Medicine established the Samuel Maheswaran Graduate Fellowship to honor Maheswaran’s 35-plus years of service to the University of Minnesota and the field of food animal health science research. During his career, Maheswaran published over 100 primary research manuscripts in the area of food animal health and infectious diseases.

The fellowship was established with lead gifts by Randy Simonson and his wife, Susan, and Newport Laboratories. Simonson earned his Ph.D. under Maheswaran. This award will support a Ph.D. student focusing on food animal health sciences in the comparative and molecular biosciences graduate program. Students will be selected based on academic standing and potential in their field.

Maheswaran’s former colleagues and students and friends of the College are invited to contribute to this fellowship fund. Give online at www.giving.umn.edu (please note that the gift is for the Maheswaran Fellowship) or contact Bill Venne, chief development officer, at 612-624-8180 or venne025@umn.edu.

Tiffany Wolf is new Pfizer-Morris Animal Foundation Fellow

Dr. Tiffany Wolf has been awarded a Pfizer-Morris Animal Foundation Fellowship, which supports Ph.D. training of veterinarians for careers as research scientists promoting animal health and well-being. Working with Randy Singer, associate professor, Wolf is studying the factors that contribute to infectious disease transmission across species. Her research will focus on the risk of transmission of Mycobacterium tuberculosis from local humans to habituated mountain gorillas in their natural habitat. For more information on the Morris Animal Foundation and the fellowship, visit www.morrisanimalfoundation.org/professionals/veterinary-fellowships-for-advanced-study/.

The Commons: a new gathering place for graduate students

Thanks to the efforts of student and College leaders and the associate dean for graduate programs, CVM graduate students now have a place to gather: This summer, the CVM released space in two rooms on the south side of the Veterinary Medical Center for the Commons.

“The Commons is a great location for student interaction and downtime between classes or experiments,” says Mary Mauzy, the Ph.D. candidate who spearheaded the effort. “The space is accommodating for lunch, relaxation, and informal meetings, while housing the history of our graduate programs.”

Facilities manager Tim Gordon coordinated clearing the rooms and cleaning; Mark Rutherford, associate dean for graduate programs, donated painting supplies and labor to refresh the walls; and Lisa Hubinger, graduate program coordinator, and Sarah Summerbell, graduate program associate, procured furnishings from the University of Minnesota Reuse Program and put the finishing touches on the space. The Commons houses bound theses, the “shower head,” an ornamental rite of passage that students sign once prelims are passed, and other communal graduate programs materials.

Directors of graduate studies Michael Murtaugh and Srinand Sreevatsan have already taken advantage of the Commons to host the first of a semester-long series of “perpetual orientation” sessions for new graduate students, which are intended to enhance a sense of community and create open dialogue between graduate students and their directors of graduate studies.

“The graduate student commons was created to enhance student interactions, social and scientific,” says Sreevatsan. “Since the two graduate programs cater to students of multiple nationalities, this forum is expected to improve international student acclimatization and involvement in programmatic activities.”

Learn more about College of Veterinary Medicine graduate programs online at www.cvm.umn.edu/gradprog.
The Raptor Center (TRC) is working on a project to protect Galapagos hawks on the Galapagos Islands. The hawks, which are endemic to the Galapagos Islands, are being brought into captivity during an effort to eradicate invasive rats from 10 small islands in the Galapagos archipelago. TRC’s role is to provide consultative input on the project, veterinary expertise with raptors, and care and management of the hawks during their time in captivity. Julia Ponder, TRC’s executive director, is spending six weeks in the Galapagos, actively managing the birds and providing veterinary support.

“I am absolutely thrilled that when the project managers realized that they would benefit from a veterinarian’s perspective, they contacted us,” Ponder says. “In addition to our experience in raptor medicine, surgery, and critical care, we also bring leadership and knowledge in the area of captive management of wild raptors, which is critical for this project.”

To learn more, go to www.cvm.umn.edu/newsarchives/2010/galapagos. See Ponder’s updates on TRC’s blog at www.theraptorcenternews.blogspot.com.

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In May, Veterinary Medical Center equine specialists cared for two very rare patients—twin foals. Initially, with help to stand, William could nurse from his mother, but Henry needed to be bottle fed for three days until he was strong enough to stand with assistance.

Because of the size of foals, the limited size of a mare’s uterus, and the type of placenta, it is extremely rare for horses to give birth to twins. (Fewer than one in a hundred such live births are successful.)

Princess, an Arabian, gave birth to the pair on the evening of April 30. Henry was born first without difficulty, and then, to the owner’s surprise, William was born. Both foals were smaller and weaker than a normal foal. The owner knew that twin foals were high risk and could develop complications such as difficulty breathing and infections, so she quickly brought them to the Veterinary Medical Center’s equine hospital. They were admitted into the neonatal intensive care unit, which has much the same equipment as a human ICU.

For three weeks, the foals received examinations, blood tests, IV fluid, IV nutrition, and antibiotic therapy from internal medicine specialists. They received constant monitoring by veterinary technicians, assisted by veterinary students and volunteers. Henry even received a blood transfusion from Hercules, the College’s blood-donating horse. The foal’s lungs and bones matured, and he successfully fought off pneumonia. On May 21, after three weeks of round-the-clock care, Henry and William went home.

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A Galapagos hawk on Santiago Island. Photo by Sue Kirchoff

Equine Center staff care for rare twin horses

Success story

The equine care team poses for a photo with the twins.

Princess and the twins, Henry and William, at home

Veterinary resident Jose Mendez encourages Henry to feed from his mother.

AROUND THE COLLEGE
Will Hueston speaks at the One Health annual meeting.

International symposium explores taking One Health from theory to practice
Individuals from industry, government, and higher education gathered at McNamara Alumni Center May 12 to network, discuss, and share ideas at the “One Health” annual meeting. Speakers and attendees came from around the globe and from varying backgrounds. Will Hueston, executive director of the Global Initiative for Food Systems Leadership, and Dan Gustafson of the Office for North America of the Food and Agriculture Organization of the United Nations provided keynote addresses.

Seed grants of $10,000 were awarded for five projects presented at the meeting. The grant recipients were:
• Peter Davies, College of Veterinary Medicine, for “Partnership to Advance Animal Feed Safety”
• Clarence Lehman, Ecology, Evolution, and Behavior, and Katey Pelican, College of Veterinary Medicine, for “Incorporating Concepts of Plant Disease into the One-Health Framework”
• Robert Morrison, College of Veterinary Medicine, for “Meeting the Challenges for Bovine TB at the Intersection of Human Health, Animal Health, and the Environment”
• Ted Radintz, Minnesota Department of Agriculture, for “Dairy-Beef Antibiotic Residue Prevention and Violator Response Team”
• Montserrat Torremorell, College of Veterinary Medicine, for “Interspecies Transmission of Influenza Virus—Human Seasonal Influenza Virus Vaccine Use Among Swine Personnel”

Learn more at www.cvm.umn.edu/newsarchives/2010/onehealth.

Animal Trauma Center to be unveiled
The Veterinary Medical Center plans to unveil a new Animal Trauma Center in the coming months.

The animal trauma center model is based on requirements developed for human medicine and leverages the unique capabilities of the VMC’s emergency and critical care team and partner specialty services, says David E. Lee, director. The VMC will continue to offer 24/7 emergency and urgent care, but the Animal Trauma Center will help mobilize resources to meet the needs of the region’s trauma patients.

New monitors inform and entertain VMC clients
In June, three 42-inch monitors were installed around the center pillar in the lobby of the Veterinary Medical Center’s Small Animal Hospital with funding from the Minnesota Veterinary Historical Museum. In addition to news, weather, and traffic data, the monitors display information about the many specialty services provided by the Veterinary Medical Center and the history of the College of Veterinary Medicine.

“The monitors give us an opportunity to share health, research, and service information with visitors and tell them about our history,” says Peter Poss, president of the Minnesota Veterinary Historical Museum. Entertaining pet videos and pictures of staff members’ pets also appear on the display.

Behavior services expanded
The Veterinary Medical Center’s Behavior Services team offers complete evaluation, diagnosis, and treatment for pets with behavior problems, such as aggression, house soiling, separation anxiety, and noise phobia. The Behavior Service recently expanded its services to include stand-alone technician appointments for pets with more isolated needs for behavior intervention.

“Pets are often confused, stressed, or frightened during routine health care procedures or in response to certain life events, and may respond with annoying or even dangerous behaviors,” says Margaret Duxbury, the board-certified behaviorist who heads the Behavior Service. There are many techniques that can help pets relax and either accept the handling or adjust to the life change more easily. New services include:

• Working with clients who need help handling their pets to check or medicate their ears, trim their nails, brush their teeth, provide insulin or allergy injections, or do physical rehabilitation
• Helping pets through major life transitions, including preparing the pet for the arrival of a new baby, a move, or the loss of a family member or pet
• Gentle Leader and basket muzzle fitting
• Working with pets on loose-leash walking and general manners

The standard charge for technician services is $60 for a 30-minute session. For more information or to schedule an appointment, contact Dana Emerson at 612-624-0797 or ashli001@umn.edu.
Leslie Sharkey inducted into AHC Academy for Excellence

Leslie Sharkey, associate professor in the Veterinary Clinical Sciences Department, was inducted into the 2010 Academic Health Center (AHC) Academy for Excellence in the Scholarship of Teaching and Learning in September. A nationally recognized teacher in veterinary and cardiovascular pathology, Sharkey has contributed to didactic and clinical instruction, research mentorship, and continuing education for veterinarians.

The AHC Academy for Excellence in the Scholarship of Teaching and Learning serves as the highest recognition of excellence in the AHC educational mission. Those selected have contributed to developing a culture of learning by demonstrating a sustained and recognized commitment to teaching and student learning through innovation, creativity, and dissemination of scholarly works and are known nationally and/or internationally for their expertise in health-related fields. The academy provides leadership to strengthen teaching and learning in the AHC.

Up to four faculty members are inducted into the academy each year. They receive a recurring annual augmentation of $10,000 for five consecutive years (which may be used as an augmentation to their salary or to support their teaching) and a lifetime membership in the Academy.

New diplomates
Recently board certified by the American College of Veterinary Preventive Medicine were:

- Tim Goldsmith, assistant clinical professor with the Center for Animal Health and Food Safety (CAHFS) and Veterinary Population Medicine Department
- Morgan Hennessey, assistant program director with the National Center for Food Protection and Defense
- Brendan Lee, veterinary public health resident, CAHFS

Mike Henson, assistant clinical professor, Veterinary Clinical Sciences Department, is now a diplomate of the American College of Veterinary Internal Medicine (specialty of oncology).

New emergency and critical care book

Small Animal Emergency and Critical Care: Case Studies in Client Communication, Morbidity and Mortality, a new book by Lisa Powell, Elizabeth Rozanski, and John Rush, has been published by Wiley-Blackwell, the international scientific, technical, and medical publishing company.

Powell is an associate clinical professor in emergency and critical care at the University of Minnesota College of Veterinary Medicine; Elizabeth Rozanski and John Rush are clinical professors at Tufts University Cummings School of Veterinary Medicine. All three are board-certified diplomates of the American College of Veterinary Emergency and Critical Care.
New faculty

Jianming (Jimmy) Wu joined the Veterinary and Biomedical Sciences Department as associate professor in July. His research interests include molecular genetics of human autoimmune diseases, such as systemic lupus erythematosus and rheumatoid arthritis; biology and genetics of human immunoglobulin Fc receptors; and regulation of human gene expression and function. He was previously assistant professor of clinical immunology and rheumatology at the University of Alabama at Birmingham School of Medicine. Wu received his D.V.M degree from Yangzhou University in China, his Ph.D. in molecular, cellular, and developmental biology from Iowa State University, and postdoctoral training at Cornell University Medical Center and the University of Alabama at Birmingham.

Christine Lim joined the Veterinary Clinical Sciences Department as assistant clinical professor of ophthalmology in September. Lim earned her D.V.M from the University of Guelph College of Veterinary Medicine and completed an internship at the University of Prince Edward Island and ophthalmology residency at the University of California, Davis. She is board certified in ophthalmology by the American College of Veterinary Ophthalmologists.

Michaela Barletta will become an assistant professor of anesthesia in the Veterinary Clinical Sciences Department in November. Barletta is a D.V.M. and Ph.D. graduate of the University of Turin in Italy. He completed his internship and anesthesiology residency at Purdue University College of Veterinary Medicine.

Ten faculty members promoted
Six faculty members’ promotions were approved by the University of Minnesota Board of Regents in May:

- John Deen, promoted to professor
- Connie Gebhart, promoted to associate professor
- Sandra Godden, promoted to professor
- Kent Reed, promoted to professor
- Pam Skinner, promoted to associate professor with tenure
- Bruce Walcheck, promoted to professor

Four additional faculty members were promoted upon the recommendation of the College’s promotion and tenure committee and their respective departments:

- Becky Davies, promoted to associate clinical professor
- Marie Gramer, promoted to associate clinical professor
- Kelly Hall, promoted to associate clinical professor
- Liz LaFond, promoted to associate clinical professor

Randy Singer testifies at health subcommittee hearing
Randy Singer, associate professor, Veterinary and Biomedical Sciences Department, testified at a hearing before the subcommittee on health in Washington, D.C., in July. The hearing examined antibiotic resistance and the use of antibiotics in animal agriculture.

Gail Buhl receives Roger Tory Peterson award
Gail Buhl, manager of environmental education at The Raptor Center, received the Roger Tory Peterson Nature Education Achievement Award from the Roger Tory Peterson Institute of Natural History. The award recognizes exemplary work in the field of nature education, continuing the legacy of Roger Tory Peterson. An American naturalist, ornithologist, artist, and educator, Peterson was considered one of the founders of the 20th-century environmental movement.

Employees honored on staff appreciation day
Abby Rodriguez, lab services coordinator, was honored with the Carl Edborg III Award and Sheila Torres, associate professor, received the Outstanding Faculty/P&A Award at the College’s annual staff appreciation day event on June 24. Longevity awards were presented to staff members who have worked at the College for 45, 40, 25, 20, 15, 10, and 5 years.

Kari Ekenstedt wins Young Investigator Award
Kari Ekenstedt, post-doctoral associate, won first place in the 2010 Young Investigator Award competition sponsored by the American Veterinary Medical Association and American Veterinary Medical Foundation. Ekenstedt and four other finalists presented their work at the Merial-NIH National Veterinary Scholars Symposium hosted by the University of Georgia in August.
Jill Schappa receives inaugural HHMI-Burroughs Wellcome fellowship

Howard Hughes Medical Research Institute (HHMI) fellowships have long been recognized as the highest level of distinction that aspiring medical students can receive to obtain research training as an addition to their clinical education. Veterinary students who wished to extend their education with yearlong intensive research experiences were only an afterthought until this year, when HHMI partnered with the Burroughs Wellcome Fund (BWF) to support a visionary effort to increase the number of young investigators in the field of veterinary research.

Enter Jill Schappa, a fourth-year veterinary student at the University of Minnesota. Jill is no stranger to research. She spent two summers working in laboratories at the Masonic Cancer Center, supported by the CVM Summer Scholars program. She has co-authored a published manuscript and presented her work at two CVM Research Day events.

During the summer of 2009, Jill became aware of work on ligand-targeted toxins being done in Dr. Daniel Vallera’s lab at the Masonic Cancer Center. She proposed to extend this work to animal tumors, with the idea that validation of targeting in cell culture models would be a first step to further develop this therapeutic approach in and for companion animals. She generated exciting results, which she used as a basis to apply for an HHMI fellowship. Her project, “Development of Targeted Toxins for Cancer Therapy Using Comparative Models,” was selected for funding from a group of 274 outstanding applications, and represents the first-ever award of this type to a veterinary student.

Paul Fuchs and Schnitzel couldn’t have been any tighter. Schnitzel, a handsome black lab-husky-shepherd mix, was the busy executive’s first dog, other than his childhood family pet.

“Schnitzel was smart. He’d catch on quickly,” says Fuchs, of Minneapolis. “We were very much in tune with what the other one wanted and needed. I knew how to read him.”

Late last summer, after sensing health problems in his 13-year-old companion, Fuchs took Schnitzel to a local veterinarian, who referred the dog to the University of Minnesota Veterinary Medical Center (VMC) for more specialized care. At one of his first visits to the VMC, Schnitzel was diagnosed with multiple cell myeloma. He was treated from August 2009 until he passed away in November 2009.

“He probably could have been diagnosed a year sooner, but I just wasn’t on the ball, and my local vet didn’t catch on. The outcome might have been the same—but a little different—had we caught it sooner,” says Fuchs.

Fuchs particularly appreciated that VMC veterinarians presented him with a realistic prognosis.

“It gave me a sense of direction because it removed a lot of uncertainty. It’s difficult to realize you’re headed down a path that cannot be changed and there is a conclusion—that conclusion being that Schnitzel is going to pass. He’s going to die.”

Losing Schnitzel was particularly difficult for Fuchs, who is single with no children.

“One year I kept a log of how much walking, jogging, and hiking we did, and it was just over 1,500 miles for the year,” Fuchs says. “We were tight. We did vacations every year on his birthday, which was July 17. I would take that week for my vacation, and we would pick a spot somewhere in Minnesota, rent a cabin along a lake, and spend the week hiking, swimming, sleeping, and relaxing.”

Fuchs remembers with gratitude the care and concern shown by VMC oncologists and those in the Companion Animal Love, Loss, and Memories (CALLM) bereavement support group session he attended.

Touched by the entire experience, Fuchs decided to donate $1,000 for each of Schnitzel’s 13 years of life. He gave $10,000 to VMC oncology services and used the remaining $3,000 to support individual owners with pet health care needs.

“I realize a lot of work, research, and learning had been done by others over the years before Schnitzel got sick, and we were the beneficiaries of that—and not just the medical portion, but how to treat your dog, the coping skills needed, and understanding the outcomes,” he explains. “I realized we got more time together because of what happened in the past. So this is my way of giving something back for the time that Schnitzel gave to me.”

For more information about CALLM, visit www.cvm.umn.edu/vmc.

Giving opportunities
There are many ways to give to the College of Veterinary Medicine, and your gift can benefit the overall mission or a specific program of your choice. For more information, contact Bill Venne, chief development officer, at venne025@umn.edu or 612-625-8480 or visit www.cvm.umn.edu/devalumni/.
**Featured scholarship—**

**Dr. Rebecca Urbanski & Scott Junkert Scholarship**

**Created:** 2006  
**Supports:** A new veterinary student who shows academic promise, particularly in companion animal care

**In their own words**  
By Becky Urbanski, Ed.D. (2000) and Scott Junkert

Sometimes in the late 1990s, our dog, Trekker, a husky mix, developed an eye condition, and our veterinarian made a referral for us to Dr. Stephen Bistner at the University of Minnesota Veterinary Medical Center (VMC).

From the minute we stepped in the door, we were impressed with the care and attention we received from the staff, doctors, and students. We were happy when Dr. Bistner made every effort to save Trekker’s sight and we were impressed with how he used Trekker’s condition as a teaching example for the students.

Trekker had several surgeries at the VMC. Living and working in Duluth, we had to leave Trek at the hospital in St. Paul. Much like parents leaving a child, we were anxious about how she was doing and what was happening to her. I can so clearly remember when one student called me at the office to give me a report. While I can’t remember his name, his upbeat attitude and extra effort reassured us that she was in the best hands ever. One of the things he said was, “I noticed Trekker was restless in her crate and was tearing up all her newspaper bedding. So I took her out for a run, and that seemed to help a lot.”

It was amazing to me that a student would care so much and know exactly what to do. What a wonderful veterinarian this student must have become!

We wanted to be a part of that for the future—training these exceptional students to take care of the animals people love. A few years later, we placed a brick in Trekker’s honor in the Memories Garden. She lived a long, happy life to age 15 and a half.

About four years ago, we started our scholarship at the University to ensure that this legacy of training exceptional veterinarians continues for the future.

Recently, our shepherd, Piper, had knee surgery at the VMC. Again, we’ve been impressed with the high levels of treatment and care that she’s received. It has only gotten better since our first experience more than 10 years ago. And that is one of the reasons we decided to remember the University of Minnesota and our scholarship program in our estate planning.

**Raptor Bowl raises funds for The Raptor Center**

University of Minnesota Regent Dean Johnson, Raptor Center Board of Advisors member Julie Lee, executive director Julia Ponder, and Susan Hommes of the University of Minnesota Foundation enjoyed lawn bowling at the fifth annual Raptor Bowl fundraising event at Brit’s Pub & Eating Establishment in downtown Minneapolis July 14. Twenty-four teams vied for the Raptor Bowl V championship and to support The Raptor Center in its annual fundraiser. Celebrity bowlers mingled with corporate teams and the public, who came out to watch and enjoy the education ambassadors from The Raptor Center. A team from Medical Technologies won first place.
The Alumni and Friends Society (AFS) is the College of Veterinary Medicine’s influential network of alumni. The AFS and its board of directors support education, research, development, and community service programs, advise Dean Trevor Ames on the dispersal of undesignated gifts to the College, and foster fellowship and cooperation among alumni, the College, the University, and the community. The AFS board is involved in a variety of projects and activities, from scholarship, mentorship, and awards programs to international externships and eLearning programs.

The AFS board recently led a successful fundraising effort to add a portable recorder to the lecture-capture systems recently installed in several College lecture halls. The lecture-capture systems record the presenter’s slides, video, and voice in a simultaneous mix for simulcast, online viewing, or use in an online course, enhancing the accessibility of lectures. The portable recorder will allow the College to follow the classroom into the field, the wet lab, and the Veterinary Medical Center, where faculty and clinicians can create modules not taught in the lecture halls.

The current AFS board president is Roy Martin, class of 1989, who is a partner with the Integra Group, a clinical and preclinical research organization that helps clients navigate the complex process of product development, clinical trials, FDA submissions, and post-market studies. The other members of the AFS board are:

- **Kevin Barcus**, class of 1986, who cofounded Mounds View Animal Hospital in 1988. A past president of the AFS board, he has been a member of the board and director of the AFS mentor program—the winner of a University of Minnesota Alumni Association Program Extraordinaire Award—since 1987.

- **Lisa Carpenter**, class of 1988, owner of Edinburgh Pet Health Center in Brooklyn Park, Minnesota.

- **Rick Goulaud**, class of 1983, director of Metropolitan Veterinary Referral Services in Eden Prairie, Minnesota. A diplomat of the American College of Veterinary Internal Medicine, his areas of interest are gastroenterology, oncology, cardiology, and respiratory disease.

- **Judy Lapham**, class of 1988, a veterinarian with Camden Pet Hospital in Minneapolis, Minnesota. Lapham is the former chair of the Surgery Suite at the Minnesota State Fair.

- **Larry Morrisette**, class of 1989, owner and medical director of Life Care Animal Hospital in St. Paul, Minnesota, where he is especially interested in surgery and internal medicine. Morrisette is a past president of the AFS board.
Barbara O’Leary, class of 1976. O’Leary has master’s degrees in veterinary anatomy and public health, is past president of the AFS and Minnesota Veterinary Medical Association, and is a former delegate from Minnesota to the American Veterinary Medical Association. Now retired, she recently became a grandmother.

Lorna Reichl, class of 1988. Reichl holds the R.K. Anderson and Ruth Foster Fellowship in Animal Behavior and is an animal behavior resident at the University of Minnesota Veterinary Medical Center. She was president of the AFS board in 2005.

Jack Risdahl, class of 1988, an owner/partner with the Integra Group, Brooklyn Park, Minnesota. Risdahl is a former faculty member at the Mayo Clinic and University of Minnesota and past president of the AFS board.

Kelly Ryan, class of 2003, a veterinarian with Banfield-The Pet Hospital. The largest privately owned veterinary practice in the United States, Banfield has more than 760 animal hospitals across the country.

Tom Schuld, class of 2002, a veterinarian at Minnehaha Animal Hospital in Minneapolis. The recipient of American Veterinary Medical Association and Minnesota Veterinary Medical Association Leadership Awards, Schuld was president of the AFS board in 2008.

Jerri Smith, class of 2003, a veterinarian with Best Friends Forever Vet Care, which provides in-home pet care. Smith is certified in veterinary chiropractic and has a strong interest in hospice for pets.

Dale Sorensen, professor emeritus and former dean of the College. A 1946 graduate of Kansas State University College of Veterinary Medicine, Sorensen taught veterinary students and conducted research in large animals. He was acting dean from 1972 to 1973.

Jerry Torrison, class of 1986, an associate clinical professor at the College and secretary/treasurer of the AFS. In addition to his D.V.M., he earned his M.S. and Ph.D. in veterinary medicine from the University of Minnesota and is a diplomate of the American College of Veterinary Preventive Medicine.

John Youngberg, class of 1971, a veterinarian with Mille Lacs Veterinary Clinic. Youngberg works with large animals and specializes in diary herd health and reproduction.

René A. Carlson voted AVMA president-elect

René A. Carlson, class of 1978, was unanimously voted president-elect of the American Veterinary Medical Association (AVMA) at the AVMA's 147th Annual Convention in August.

A small animal veterinarian in Chetek, Wisconsin, Carlson's experience includes serving on the AVMA's House of Delegates (HOD) from 1996-2003 and two years as the association's vice president from 2004-2006. Her term as president will run from 2011-2012.

"Veterinarians have been the quiet, compassionate, silent heroes for decades," Carlson said in her address to the AVMA HOD. "Now is the time we must become more visible and vocal. We must awaken the giant within us, or veterinary medicine will be left behind in areas in which we need to be engaged, such as food safety and security, surveillance and containment of zoonotic disease, and service in rural communities—all while maintaining our special niche of healing and health care for the variety of animals with which we share our lives on this earth."

One of Carlson’s goals as president-elect and president will be to help increase diversity in the association, and she hopes to serve as an inspiration for others who might get involved.

Carlson graduated from the University of Minnesota College of Veterinary Medicine in 1978 and completed a clinical internship in small animal medicine and surgery in Springfield, Massachusetts, in 1979. She has been in small animal practice ever since, opening the Animal Hospital of Chetek in 1996.

Carlson is past president of the Northwestern Wisconsin Veterinary Association and Wisconsin Veterinary Medical Association. She served on the board of directors of the American Veterinary Medical Foundation from 1999-2002, and was also a member of the AVMA's Council on Education. She was honored as Wisconsin's Veterinarian of the Year in 2001.

Carlson's husband, Mark, is also a veterinarian. He worked as a dairy practitioner for several years before joining the Wisconsin Veterinary Diagnostic Laboratory, where he currently works as a diagnostic pathologist.
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Continuing education opportunities

**Mather Lectures**
Monthly through May
6:30-8:30 p.m.
215 Pomeroy Student-Alumni Learning Center
New–Simulcast on the Web!

- **December 2, 2010:** Information Resources and Searching Techniques for the Private Practice Veterinarian: Staying Ahead of Your Client with Evidence-Based Medicine, presented by André Nault, veterinary medical librarian
- **January 13, 2011:** Understanding Canine and Feline Periodontal Disease: Local and Systemic Pathophysiology, Including Traditional and Novel Treatment Options, presented by Dr. Kevin Stepaniuk
- **March 3, 2011:** Companion Animal Cardiology Diagnostics and Therapeutics, presented by Dr. Christopher Stauthammer
- **April 7, 2011:** Ten Things You Should Know About Obesity in Dogs and Cats, presented by Dr. Jane Armstrong
- **May 5, 2011:** Diagnostic Approach to Pruritus in Dogs, presented by Dr. Sandra Koch
- **June 2, 2011:** The Canine Reproductive Tract: Breaking News, presented by Dr. Margaret Root Kustritz
- **Basic Raptor Rehabilitation Workshop**
  May 3-6, 2011
  The Raptor Center

- **Minnesota Dairy Health Conference**
  May 17-19, 2011
  Minneapolis Airport Marriott

- **Allen D. Leman Swine Conference**
  September 17-20, 2011
  Saint Paul RiverCentre

For more information about continuing education opportunities or to register, visit www.cvm.umn.edu/VetMedCE or call 612-624-3434 or 800-380-8636.