

# Advance

UC DAVIS SCHOOL OF VETERINARY MEDICINE

Spring 2017



## Protecting the Nation's Food Supply

Fourth-year students from DVM programs across the country visit the school's Veterinary Medical Teaching and Research Center (VMTRC) in Tulare to gain invaluable experience as they pursue careers as food animal veterinarians. They will be on the front line of protecting the nation's food supply by ensuring the health of animals in the dairy, beef and poultry industries.

Earlier this year, UC Davis fourth-year students Margaret Austin (left) and Hannah MacDonald received hands-on training at Tulare-area dairies under the guidance of Dr. Wagdy El-Ashmawy, a resident at the VMTRC. They helped vaccinate calves, took blood samples to test for various diseases and learned more about herd health management. Both students say their experiences in working on large dairy farms have been a huge help in expanding their knowledge of herd health management, while also developing skills like muscle memory.

In Egypt, where El-Ashmawy serves as assistant professor of infectious disease at Cairo University, approximately 70 percent of animals are owned by small farmers, although there are some large farms. The residency program with UC Davis provides him with more experience on farms with a greater number of animals.

"Additionally, I've increased my experience in designing and evaluating epidemiology studies," he says. "I look forward to transmitting this knowledge to my students in Egypt."

**Keeping livestock and poultry healthy is critical in preventing the rise of antibiotic-resistant infections that kill 23,000 people each year in the U.S.**



**UC DAVIS**  
VETERINARY MEDICINE

*Leading veterinary medicine, addressing societal needs*



## Exploring **Veterinary Careers** at CDC

**“CDC Veterinary Students Day left me feeling like I could make a true impact in my veterinary career, applying One Health principles wherever my career should take me.”**

— Marlene Haggblade,  
Class of 2019

Ten UC Davis veterinary students, and faculty mentors Drs. Ashley Hill and Janet Foley, joined hundreds of other students and faculty from across the country at CDC Veterinary Student Day. Organized by the CDC's National Center for Emerging and Infectious Zoonotic Diseases, the event's theme was “The Secret Life of Vets and Pets.” The bi-annual conference focuses on the critical role veterinary medicine plays in global public health and encourages student interest in veterinary public practice careers.

“Visiting CDC was like a trip to Disneyland for nerds,” said Kim Conway, Class of 2018. “We talked with Dr. Robyn Stoddard ('00) and heard firsthand about her challenges while responding to the Ebola outbreak.”

CDC Acting Director Dr. Anne Schuchat kicked off the event, which featured a number of presentations that showcased epidemiology and science in action, public health challenges, emerging zoonotic disease threats, control strategies, and the value of the One Health approach. Topics included Ebola, rabies, MERS, E.coli 0157 and Rocky Mountain spotted fever. A “Meet the Public Health Experts” panel featured professionals from several federal agencies (CDC, USDA-FSIS, USDA-APHIS, FDA) and veterinary associations (AAVMC, AVMA and NASPHV).

“The most inspirational part of the trip was meeting with UC Davis alumni,” said Lynae Shubin, Class of 2019. “I was so impressed with their success and it was incredible to think that they were once exactly where I am now.”

Students had the opportunity to network, making valuable contacts with veterinarians already working at the CDC. One of the highlights for the team was hearing the different career and education paths that veterinarians in public health roles had taken to get to their current positions, and the variety of career opportunities—from laboratory work to outbreak response.

“My career focus is on the larger issues in infectious disease prevention and control through a [One Health perspective](#),” said Anne Kimmerlein, a graduate student in the [Master of Preventive Veterinary Medicine program](#). “In fact, my goal is to participate in the Epidemic Intelligence Service at the CDC after graduation.”

UC Davis veterinary students and faculty mentors Ashley Hill and Janet Foley attended CDC Veterinary Student Day.

## Bladder Cancer Diagnosis Deserves Second Look

A diagnosis of cancer in an animal is often devastating. Thankfully, for some horses diagnosed with bladder cancer, equine internal medicine veterinarians have characterized a clinical syndrome known as hemorrhagic cystitis that closely mimics the cancer, but is an easily-treated condition.

A retrospective study of UC Davis [veterinary hospital](#) patients over an 11-year period identified hemorrhagic cystitis as a disorder that shows similar symptoms and conditions of bladder cancer in horses—painful or uncomfortable urination, and often blood in the urine (hematuria). The study, led by resident Dr. Fauna Smith under Dr. Gary Magdesian's mentorship, is the first to describe this type of bladder inflammation in horses.

All 10 horses were treated with antibiotics; eight of them returned for follow-up cystoscopy. They responded rapidly to the medication and showed clinical improvement with complete resolution of lesions in an average of six weeks. After the lesions and hematuria resolved, all 10 horses returned to their previous functions.

Smith presented her research at the 2016 American Association of Equine Practitioners annual convention and encourages equine clinicians to consider this condition as an important differential diagnosis when bladder cancer is suspected grossly or histologically in horses with hematuria. Since the conditions can look similar, horses should be rechecked after a period of two to four weeks of treatment to confirm the diagnosis.

As the veterinary school with the most comprehensive advanced training program, UC Davis is able to offer its residents valuable research opportunities not available at other institutions, enhancing the dissemination of information that changes outcomes for horses.

## Saving Rare Kakapos

From steep climbs through thick forest in the middle of the night to 24-hour care of critically-ill chicks, Dr. Joanne Paul-Murphy has given her all to help save the rare kakapo. For more than a decade, she has volunteered with the Kakapo Recovery Group to preserve this large, flightless nocturnal parrot indigenous to New Zealand.

As a zoological medicine veterinarian with a special interest in birds, Paul-Murphy has helped advance the management of health issues and disease risk, as well as hand-rearing chicks. She was recently recognized by the recovery group with the Award for Outstanding Services to Kakapo Conservation for her “unwavering commitment, professionalism and willingness to share (her) expertise.”

Paul-Murphy, who currently serves as chief of the [Companion Exotic Animal Medicine and Surgery Service](#), joined the group in 2002 when the surviving kakapo



Dr. Joanne Paul-Murphy with a kakapo in New Zealand.

population was made up of only 86 individuals. That number has now doubled. During her recent sabbatical year in New Zealand, Paul-Murphy served as a scientific consultant to the group and provided clinical care to the birds. Forty-six kakapo chicks hatched during this time, with 34 of them being added to the current population of 164 birds.

In 2009, one of the chicks hatched that year was named Bluster Two-toed Murphy, after Paul-Murphy saved the 14-day old bird from life threatening injuries suffered during a blustery storm. The chick was transported off the island in a helicopter as soon as the storm cleared. Paul-Murphy was able to

anesthetize him, suture a large wound over the abdomen and amputate two crushed toes. Paul-Murphy considers it her greatest honor from the kakapo group.



## Using Satellite Data to Control Mosquitoes & Zika

**“By partnering with NASA, we are able to provide critical information to improve surveillance and control of the mosquitoes that might transmit Zika virus here in California. The models allow us to simulate invasion processes in ways that we could never observe directly, even with the best surveillance. This gives us a chance to put tools in the hands of public health and vector control officials that allow them to ask their own what-if questions to guide decision making and improve the health of communities in California.”**

— Chris Barker,  
UC Davis epidemiologist

Fighting mosquito-borne diseases sometimes starts with a big-picture approach—one gained from looking at earth from space. With the help of satellite observations and a \$1.3 million grant from NASA, UC Davis epidemiologist Chris Barker leads a collaborative effort to develop predictive models to better understand and control invasive mosquitoes and the viruses they carry, particularly Zika.

Last year, Zika became a health issue of serious concern after infection with the illness was linked with microcephaly, a devastating birth defect. The virus is carried primarily by two species of mosquitoes, *Aedes aegypti* and *Aedes albopictus*. Until a few years ago, health officials in California weren't overly concerned with foreign-sounding diseases like Zika, dengue and chikungunya—all carried by *Aedes* mosquitoes—because the species hadn't been found in the state.

By 2011, however, *Aedes albopictus* had been discovered in southern California, and two years later, *Aedes aegypti* was detected in the Central Valley and the Bay Area. These mosquitoes were known as invaders in other parts of the world already, and it soon became clear that these species were now a growing problem in California's cities. This created an urgent need for tools to monitor and understand the mosquitoes' spread to guide control programs.

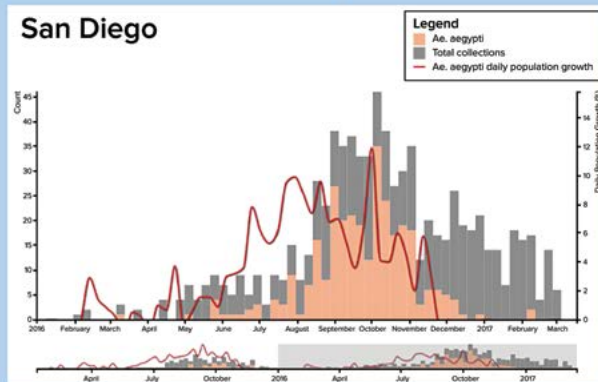
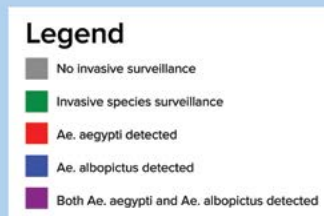
That's where NASA comes in. For decades, the space agency has assisted researchers in studying the spread of diseases such as malaria, Lyme disease, yellow fever and West Nile virus by providing them with satellite observations that inform predictive models for vector-borne diseases. These models can then be used by public health organizations to make decisions on prevention strategies and how to inform communities about their risk for various diseases.

So far, Barker's team has built a detailed model for the spread of *A. albopictus* on realistic urban landscapes with the aid of collection data in Los Angeles and remotely sensed data. They've also completed maps for potential *Aedes* population growth in the U.S. and real-time online maps for the distribution of both *Aedes* species in California.

When NASA first awarded Barker the three-year grant in 2015, Zika virus hadn't yet emerged as a global health threat, but that has changed over the past year. Zika-infected travelers are now detected regularly in California and other parts of the U.S. Barker says that the biggest risk from Zika virus is the potential for short-term outbreaks initiated by infected travelers, but there is little chance that Zika will spread as efficiently in California as it does in tropical locations such as Brazil.

To better understand where Zika transmission is possible, Barker and his colleague, virologist Lark Coffey, are conducting laboratory studies to understand the temperature limits of Zika transmission and which species might be able to transmit it here. These basic data will then feed into the team's predictions of Zika transmission risk that blend NASA data and models with the information gained through surveillance.

A map of invasive mosquitoes in California with inset graph shows *Aedes aegypti* detections in San Diego over time, along with modeled estimates of mosquito population growth (red line) based on temperature data from NASA's Terrestrial Observation and Prediction System.



## Veterinarians May Hold Key to Managing

## Human Heart Disease

Veterinarians at the school and a team of national researchers have discovered a breakthrough in the treatment of cats stricken with hypertrophic cardiomyopathy (HCM). Their use of a new drug, MYK-461, on five cats with a naturally occurring form of inherited HCM has shown promise that the drug is safe and effective. This research could lead to a viable treatment of HCM, a currently incurable disease that also affects humans.

HCM is the most common form of feline heart disease and results in thickening of the walls of the heart ventricles, altered heart function, and sometimes fatal consequences. Cats with this disease may suffer blood clot formation, congestive heart failure and sudden death.

HCM affects approximately one in 500 people and was recently reported to strike a startling one in seven cats. More than 1,500 genetic mutations have been associated with the disease in humans, which creates challenges for researchers. However, veterinary scientists are making strides to identify the best treatment options for the disease since the cat condition and human condition are so similar.

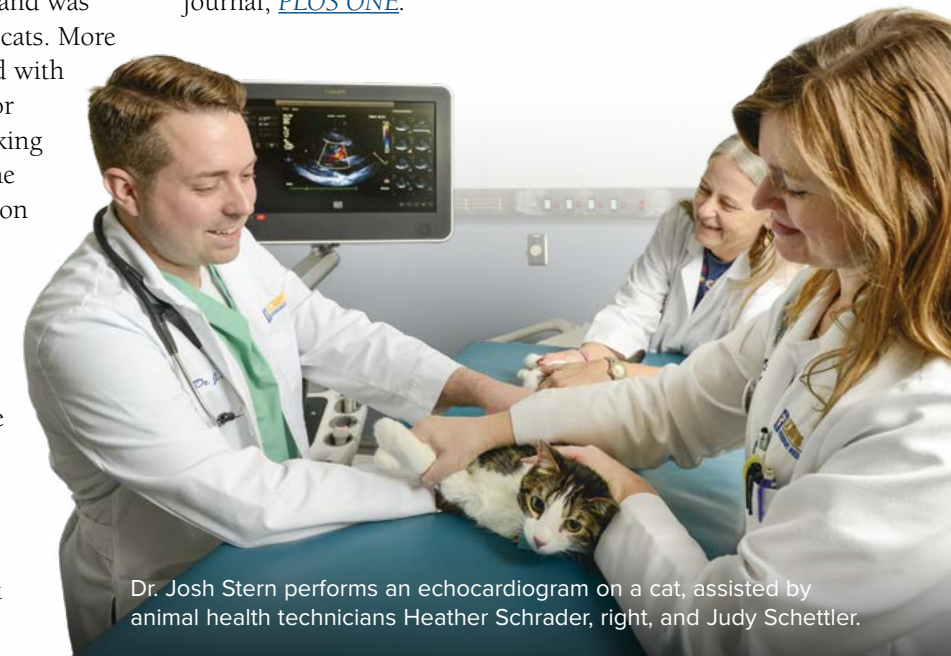
“This is an exciting discovery for both animals and humans – an excellent representation of the One Health concept in action,” said Dr. Josh Stern. “The positive result in these five cats shows that MYK-461 is viable for use in cats as a possible option to halt or slow the progression of HCM.”

With this application in cats, a pathway to a cure for HCM in humans may have been opened. Current treatment for cats with HCM is largely symptomatic; there is no preventative therapy that

is shown to change the course of disease. This breakthrough with MYK-461 is a step toward that. The school hopes this preliminary study will soon lead to a [clinical trial](#).

“There has been little to no progress in advancing the treatment of HCM in humans or animals for many years,” added Stern. “This study brings new hope for cats and people.”

Other school collaborators on the project included Drs. Yu Ueda (Stern's Ph.D. student and a hospital emergency specialist) and anesthesiologist Peter Pascoe. Stern presented their findings at this year's annual meeting of the American College of Veterinary Internal Medicine, and a paper on their discovery was published in the peer-reviewed scientific journal, [PLOS ONE](#).



Dr. Josh Stern performs an echocardiogram on a cat, assisted by animal health technicians Heather Schrader, right, and Judy Schettler.

## Center for Companion Animal Health Celebrates 25 Years

The school's [Center for Companion Animal Health](#) (CCAH) is celebrating 25 years of advancing the health of companion animals. Through the generosity of the center's donors, the CCAH has awarded \$17 million to launch innovative programs, build state-of-the-art facilities and foster cutting-edge research achievements. Advancements have been made in oncology, genetics, nutrition, infectious disease, surgical techniques and stem cell treatments. Through the Koret International Veterinary Exchange program, the CCAH has brought scholars to Davis and sent team members to Israel and other parts of the world. Resident educational support has enhanced clinical training programs and investments in equipment raised the

level of care available. The future continues to hold promise for even greater impacts. More than 70 proposals are funded annually by the [CCAH](#). Current studies include:

- Evaluating the safety of fish oil as a nutritional supplement in cats
- Identifying characteristics that will aid in social pairing of parrots
- Scanning the canine genome for longevity-related traits in aged golden retrievers and Labrador retrievers
- Developing a toxoplasma vaccine for cats

“I am proud and heartened by the work being done at the school to advance animal health,” said Dr. Michael S. Kent, CCAH director.





## Connecting Animal Healthcare and Pharmacy Education

Historically, pet owners have relied upon their veterinarians for pet medications, as well as their knowledge about appropriate dosages and adverse reactions for a wide range of species. However, a growing number of pet owners obtain prescriptions for their pets from community-based pharmacies, online retailers or compounding facilities.

Recognizing this trend, the American Veterinary Medical Association recently announced its plans to work with the National Association of Boards of Pharmacy to offer veterinary education for pharmacists. Currently, schools of pharmacy in the U.S. are not required to include veterinary pharmacology in their curriculum.

Already at the forefront, the school has established training for Doctor of Pharmacy (PharmD) graduates through a residency at the veterinary hospital and the [Clinical Pharmacy Fellowship Program](#) at the UC Veterinary Medical Center, San Diego. UC Davis is one of only



Dr. Krysta Martin, PharmD, FSVHP, former resident and staff pharmacist, and Dane Van Lissen, PharmD candidate from UC San Diego Skaggs School of Pharmacy and Pharmaceutical Sciences.

four recognized programs across the country that offers advanced training for pharmacists, specifically designed to integrate them in veterinary medicine and prepare professionals who are well-suited to meet the growing industry needs in veterinary medicine.

Residents and fellows divide their time between [Davis](#) and [San Diego](#). Through advanced clinical training in all aspects of small animal clinical pharmacology and rigorous research, post graduate pharmacists are able to understand and participate in the management of small animal patients with a variety of common diseases, perform basic compounding procedures and oversee technical staff performing compounding functions.

The residency and fellowship programs rely exclusively on partnerships for funding to support the operational needs of the program, which includes research and innovative clinical training support. For information about supporting the residency and fellowship programs, please contact the [Office of Development](#) at 530-752-7024.

## Protecting the Salish Sea Forever

The Salish Sea, regarded as a jewel of the Pacific Northwest, is one of the world's largest and biologically rich inland seas. The Salish Sea region is home to 37 mammal species, 172 bird species, 247 fish species, more than 3,000 invertebrate species and nearly 8 million people. But between 2008 and 2011, the number of wildlife species in the Salish Sea listed as threatened or endangered nearly doubled from 64 to 113. The SeaDoc Society, a premier program of the school's [Karen C. Drayer Wildlife Health Center](#), launched the Salish Sea Forever Campaign—seeking to raise \$1.5 million to amplify research efforts to protect this coastal ecosystem.

SeaDoc has been instrumental in the recovery and protection of some of the region's most revered species, such as abalone, orcas, sea stars, and tufted puffins. Over the next five years, their goal is to double scientific research and science translation to mitigate the risks that threaten marine life.

"The Salish Sea is one of the most amazing places on Earth and people who live here want to pass on a healthy ecosystem to future generations," said Dr. Joe Gaydos, veterinarian and science director of the SeaDoc Society. "Our work helps ensure there will still be amazing wildlife, harvestable fish and shellfish, and clean water far into the future."

To sign up for free SeaDoc monthly electronic updates or to support the [Salish Sea Forever Campaign](#), please visit [www.seadocsociety.org](http://www.seadocsociety.org) or contact the [Office of Development](#) at 530-752-7024.

The 2013 outbreak of sea star wasting disease caused high mortality in some of the Salish Sea's 29 species of sea stars, while others have escaped unscathed. SeaDoc and their colleagues helped identify the virus responsible for this outbreak (paper published in *PNAS*) and recently published a paper in *PLOS One* showing which sea star species were impacted and which were not.

## The Changing Face of Veterinary Medicine

We live in a rich, multi-cultural society where veterinarians and pet owners have different world views, languages, religious beliefs, biases, gender identity, abilities and other diverse characteristics. As a veterinary community, it's invaluable that we embrace these differences, learn from each other and appreciate the unifying element we all share – the desire to help animals.

How might cultural diversity impact veterinary communications? A language barrier between veterinarian and client could impact the client's understanding of the prescription dose instructions. Due to cultural norms, that client may be reticent to ask for clarification. That difference could result in an overdose. Eye contact is another example. In some cultures, making eye contact is considered disrespectful, but westerners see direct eye contact as a sign of attention and trust.

Students, faculty and staff at the school have the opportunity to participate in educational activities, workshops and seminars to learn about and [embrace the range of cultural differences](#) that make up society, and help us to deliver better veterinary care. One initiative funded annually by the school provides for 10 students, faculty and staff to participate in the online certificate training program offered by the [Center for Excellence for Diversity and Inclusion in Veterinary Medicine](#), jointly sponsored by Purdue University College of Veterinary Medicine and the Association of American Veterinary Medical Colleges. The program is designed to improve their communication, leadership, teaching, learning, and cultural competency skills.

Program participants complete a series of 13 learning modules, three hours of community engagement, four one-hour pertinent activities (i.e. lectures, festivals, art exhibits), and a final capstone paper. Certificates and nine hours of continuing education credit are awarded upon completion.

**"I found the program worthwhile as there is so much research into inclusion and diversity that I did not know, and some of the recommendations for how to approach a diverse client population were new to me."**

— Katherine Hansen, Assistant Professor

**"Anyone in veterinary medicine – whether a DVM, a student, or an administrative staff member – would benefit from lessons on diversity and the importance of understanding and including all groups in our society. The program highlighted the background and overarching need for diversity within the profession, as well as introducing ways to incorporate this knowledge into any veterinary clinic."**

— Jennifer Norman, Class 2016



Forty-two percent of the incoming veterinary students (Class of 2020) at UC Davis are non-Caucasian, which reflects the changing demographics of California and the nation.

## Veterinary Medicine Student Services and Administration Center



The newly opened **Veterinary Medicine Student Services and Administration Center** houses 100 staff and school leaders dedicated to providing a range of services and support for the school's community of students, faculty and staff. This facility is a major piece of the school's overall masterplan designed to co-locate the teaching, research, clinical and administrative functions at the Health Sciences District. The center brings together teams formerly housed in multiple locations across campus, and promotes easier communication and collaboration. The complex includes Scrubs Cafe, indoor and outdoor artwork, and a large area for events that also serves as a gateway to the UC Davis Arboretum.

[www.vetmed.ucdavis.edu](http://www.vetmed.ucdavis.edu)

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## Veterinary Continuing Education

# Calendar

530-752-3905  
Fax: 530-752-6728  
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The school is committed to lifelong learning through its Veterinary Continuing Education by providing nearly 20 annual offerings.

**For a complete listing of events, visit:** [www.vetmed.ucdavis.edu/CE/](http://www.vetmed.ucdavis.edu/CE/)

### June 2-4

Blood Bank Boot Camp  
UC Davis

### June 22-27

International Society for Anthrozoology Conference  
UC Davis

### July 22-23

10th Annual Back to School Seminar  
UC Davis

### October 13-15

Fall Festival  
UC Davis

## Veterinary Center for Clinical Trials

The Veterinary Center for Clinical Trials is dedicated to accelerating the identification and development of diagnostics and therapeutics for the benefit of veterinary and human patients. There are more than 50 ongoing veterinary clinical trials in different specialties and species, including:

- Bladder stones in dogs
- Sudden blindness in dogs
- Oral melanoma in dogs
- Diabetes mellitus in cats
- Gingivostomatitis in cats
- Leopard spotting complex in horses
- Recurrent uveitis in horses

For more information on these and other ongoing clinical trials, visit: [www.vetmed.ucdavis.edu/clinicaltrials](http://www.vetmed.ucdavis.edu/clinicaltrials).



## World Spay Day

More than 150 faculty, staff and students recently participated in World Spay Day, an annual campaign of the Humane Society to provide low cost spays and neuters. Not only did the program provide a much-needed community service to local pet owners, it also provided a great learning opportunity for students, allowing them to assist with 64 procedures. One of the school's strategic goals is advancing the well-being of animals and people in California, accomplished by addressing societal problems where the school can make an impact. Spay Day was a great example of that in action by helping to control animal overpopulation, and by minimizing unwanted dogs and cats.



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