UCDAVIS VETERINARY MEDICINE

Leading Veterinary Medicine, Addressing Societal Needs

Updates and Impacts
September 2016

WELCOME TO THE CLASS OF 2020!

Our new class of 145 veterinary students (125 women/20 men), like so many before them, comes with their own histories, talents, and dreams. The incoming class is an amazing group of students with a variety of life experiences including: biking from Vancouver to San Diego; serving in Ecuador in wildlife conservation; working with non-human primates and bats; working as a professional photographer; runners including a marathon runner and a triathlete; a fast pitch softball player for the Puerto Rico National Team; a black belt in Aikido and many musicians. One student is a twin with younger siblings that are triplets and many come to us with multicultural backgrounds (42%) and speak several languages. The mean overall GPA = 3.63. The incoming class career interests are: private practice/specialty practice (109); academics/research/teaching (26); and public health (10).

We will offer them unique opportunities to explore research, participate in outreach activities and provide them the fundamental knowledge for future treatments of animals and people. The new student services and Scrubs dining facilities, opening in January 2017, will provide them a consolidated and interactive center of support, networking and refreshment. As they become enlightened during their educational journey with us, their light will shine on the faculty and staff, adding to the collective history of the school.

NEW FACULTY

Dr. Amir Kol recently joined the Department of Pathology, Microbiology and Immunology as an Assistant Professor of Veterinary Clinical Pathology. Kol received a BsC (1999) in Animal Sciences from The Hebrew University of Jerusalem, Israel and DVM (2006) from the Koret School of Veterinary Medicine, The Hebrew University of Jerusalem, Israel. Dr. Kol completed his residency (2011) and earned his PhD from UC Davis in 2015 with a thesis focused on mesenchymal stem cell interactions with T helper cells in dogs and the implications specifically for gastrointestinal inflammation and translational research. He is a Diplomate of the American College of Veterinary Pathologists, Specialty: Clinical Pathology. His research focuses on stem cell biology and how

stem cells modulate the immune system and contribute to tissue regeneration and repair. Dr. Kol will teach veterinary students, house officers and visiting scholars, and provide diagnostic services and consultations with referring clinicians.

Dr. Chen Gilor joined the Department of Medicine and Epidemiology as an Assistant Professor of Small Animal Internal Medicine. Gilor received his DVM (1997) from the Koret School of Veterinary Medicine, The Hebrew University of Jerusalem, Rehovot, Israel and his PhD (2010) from the College of Veterinary Medicine, University of Illinois at Urbana-Champaign. After working in private practice for five years in Israel and New York, he completed an Internship in Small Animal Medicine at the Animal Medical Center in New York (2005) and a Residency in Small Animal Medicine at the University of Illinois (2008). Gilor served two years as an internal medicine consultant for Idexx Laboratories in Wetherby, England and then joined the faculty at The Ohio State University as an Assistant Professor of Small Animal Medicine (2012). He is a Diplomate of the American College of Veterinary Internal Medicine-Small Animal Internal Medicine. Gilor will teach veterinary students and residents and pursue research in endocrinology--specifically investigations of diabetes and obesity therapeutics.

Dr. Mary Lassaline recently joined the Department of Surgical and Radiological Sciences as an Associate Professor of Clinical Equine Ophthalmology. Lassaline received her MA (1988) from the University of Illinois-Champaign, PhD (1994) in Cognitive Psychology from the University of Michigan, and DVM (2000) from Michigan State University. She completed her Residency program in Ophthalmology at the University of Florida-Gainesville in 2004. Lassaline is a Diplomate of the American College of Veterinary Ophthalmologists. She was at the University of Pennsylvania, New Bolton Center where she was an Associate Professor before coming to Davis in 2014 as a Senior Veterinarian (2014) with the Ophthalmology Service. Lassaline will be responsible for teaching veterinary students and residents and providing clinical patient care and consultation in the Equine Ophthalmology Service.

Dr. Benjamin Moeller joined the California Animal Health and Food Safety Laboratory System and the Department of Molecular Biosciences as an Assistant Professor of Clinical Equine Analytical Chemistry. Moeller received his undergraduate training in biochemistry and molecular biology (2004) and PhD in pharmacology/toxicology (2010) from the University of California, Davis. He served as a Postdoctoral Researcher (2010) with the University of North Carolina and joins us from the Analytical Chemistry Laboratory, Scientific Core Laboratories, Lovelace Respiratory Research Institute, Albuquerque, NM where he was appointed as an Associate Research Scientist and Manager. Moeller is a Diplomate (2015) of the American Board of Toxicology. As a faculty member in the Equine Analytical Chemistry Laboratory, Moeller will be responsible for the development and operation of a technologically advanced laboratory for drug testing horses.

NEW LEADERS

Dr. John Angelos has been appointed as Chair of the Department of Medicine and Epidemiology. He will have oversight and management of departmental budget and staff; mentorship of department faculty; allocation of space, and other department matters. Angelos is a veterinary internist with expertise in livestock medicine and surgery, whose clinical competency is outstanding and recognized nationally. His research is focused on understanding the pathogenesis of infectious

bovine keratoconjunctivitis (pink-eye), an economically important disease in cattle, and systematic efforts to develop an efficacious vaccine.

Dr. Lisa Tell has been appointed as Vice-Chair of the Department of Medicine and Epidemiology. As Vice-Chair, Tell will assist Angelos with academic personnel actions and mentoring junior faculty. Tell is specialty board certified in companion avian practice and in zoological medicine. She serves as Western Regional Director for two national programs located on the campus – FARAD (the Food Animal Residue and Depletion Program) and NRSP-7 (Minor Use Animal Drug Program). Her research is focused on expanding therapeutic options for treating minor food producing animal species through pharmacokinetic studies designed to assess drug depletion, avoid violative drug residues, and protect the human food safety.

Dr. Pamela Hullinger has just been appointed Director of the California Animal Health and Food Safety Laboratory System. Hullinger is a board certified specialist in veterinary preventive medicine (2001), and graduated with a DVM (1990) and MPVM (2001) from UC Davis. After working in private large animal practice, she completed a residency in equine medicine at UC Davis in 1996. Subsequently Dr. Hullinger worked as a veterinary medical officer for the California Department of Food and Agriculture and as Chief Veterinary Officer - Food and Agricultural Security Program, Global Security Directorate of Lawrence Livermore National Laboratory (LLNL), US Department of Energy – a position she still holds with active grant support related to transboundary animal disease. As Director, Hullinger is responsible for all aspects of CAHFS operations and administrative matters ensuring the complete and timely diagnostic services related to food safety and security, animal health emergency management and equine health and performance. CAHFS is expected to provide support to agencies involved in the control of transboundary animal disease and other diseases that threaten the viability of California livestock and poultry industries.

Dr. Woutrina Smith has been named one of the leaders of the UC Global Health Institute's new Center of Expertise on Planetary Health. The center has two co-directors: Smith, associate professor of infectious disease epidemiology in the School of Veterinary Medicine; and David Lopez-Carr, professor of geography and director of the Human-Environment Dynamics Lab at UC Santa Barbara. The institute's centers of excellence are charged with developing and leading UC-wide education programs, targeted multi-campus research endeavors, and sustainable international partnerships for implementing programs and interventions to improve health globally and in California.

CURRENT FACULTY RECRUITMENTS

- Assistant Professor of Zoological Medicine – Candidate Approved
- Assistant Professor of Clinical Small Animal Soft Tissue Surgery – Candidate Approved
- Appointment via Change in Title from Researcher/Adjunct Professor (WOS) to Professor of Respiratory Toxicology (50%)/Professor- In Residence (50%) – Candidate Identified
- Assistant Professor of Developmental Cancer Therapeutics – Candidate Identified
- Assistant Professor of Clinical Equine Emergency Surgery and Critical Care – Candidate Identified
- Professor of Neurology/Neurosurgery
- Professor of Dermatology
- Professor of Small Animal Emergency & Critical Care Medicine
- Professor of Arboviral Epidemiologist

- Professor (50%: 25% CCM, 25%CNPRC)/Professor In-Residence of Infectious Disease (50%)
- Professor (50%)/Professor In-Residence (50%) of Respiratory Biology or Toxicology
- Health Sciences Clinical Professor in Community Practice (3 positions)
- Professor of Clinical Small Animal Orthopedic Surgery
- Specialist in Cooperative Extension-Beef Cattle Herd Health and Production
- Specialist in Cooperative Extension-Dairy Cattle Production Health Management

VISION FOR THE VETERINARY MEDICAL CENTER

The school's vision for the future includes the planning of the new Veterinary Medical Center (VMC), a place of discovery, innovation and healing. This state-of-the-art facility will transform the experience of our animal patients and their human companions through innovative building designs, coordinated patient care with experts in more than 34 specialties, and unique technical advances in diagnostic services. The facility will include a number of new buildings and renovation of existing facilities to achieve an optimum physical plant with a coordinated flow of activities and program adjacencies. Project construction will be choreographed to ensure that patient care operates smoothly throughout the 10-year phased plan. Planning efforts for the new VMC have identified a number of project groups to be constructed in sequence:

- Small Animal Clinic Examination Rooms (Remodel)
- Large Animal Support Facility
- Livestock and Field Service Center
- Equine Performance Center
- All Species Imaging Center
- Small Animal Hospital East Wing
- Small Animal Hospital West Wing
- Community Practice Consolidation
- Equine Surgery and Critical Care Center
- Equine Isolation

Each of these structures will advance our ability to handle the hospital's large and challenging caseload, allow for the adoption of the latest technologies, and provide the infrastructure and efficient services to facilitate translational research.

CALIFORNIA ANIMAL HEALTH AND FOOD SAFETY LABORATORY SYSTEM

Located adjacent to the existing Veterinary Medicine Teaching and Research Center in Tulare County, the new branch laboratory of the California Animal Health and Food Safety Laboratory System will provide complex diagnostic procedures to support ongoing food production industries, flock and herd

health monitoring, food safety programs and surveillance for foreign and emerging diseases. Services offered will include Necropsy, Bacteriology, Histology, Antigen Detection, Immunology, Biotechnology, and Metabolomics testing. This $47.5M state funded project continues the long-term partnership between the university and the California Department of Food and Agriculture (CDFA) in protecting human and animal health. A dedication ceremony is being planned for October 28, 2016.

TACKLING STUDENT DEBT

The school's faculty and leadership are very concerned about the economic well-being of our professional veterinary students and are proactively working on multiple fronts to reduce the financial burden associated with the cost of a veterinary medical education.

Stabilizing Tuition and Fees

The school's current tuition and fees for the total 4-year veterinary program equals $129,259; living expenses, transportation and health insurance would be additional costs. There are only limited opportunities for the school to influence student fees which are mandated by the university and part of the overall university funding strategy. The student tuition and fees are essentially comprised of four major parts: campus tuition ($11,220), campus annual fees ($1,981), Professional Degree Supplemental Tuition (PDST) ($15,594), and Course Materials and Services Fee (CMSF) ($2,524). Although the school has no influence over the first two campus fees, we have been able to impact the PDST and CMSF fees. During the past six years (2011/12-2016/17), the PDST fees for the DVM and MPVM programs has only been modestly increased once and the CMSF fees have not been increased at all. UC Davis has one of the lowest debt to cost ratios in the country (AVMA, 2016) and lower than average overall debt ($118,376 vs. $130,179, AAVMC Comparative Data Report, 2015).

Making Education Affordable:

- **Financial Aid from Tuition -** At the University of California, approximately one-third of all tuition and Professional Degree Supplemental Tuition is returned to students as financial aid. Therefore, 100 percent of our veterinary students receive on average $6,700 annually in financial aid. This unique requirement by the university has greatly benefited our students throughout their 4-year program.

- **Scholarship Support -** Raising funds for student scholarships continues to be a very high priority for the school's leadership and advancement team. The school's endowment has now grown to more than $68.7 million making it one of the largest veterinary scholarship endowments in the country. In 2016 the earnings from the endowment, coupled with current scholarship gifts, allowed us to provide $2.7 million in scholarships and another $4 million through the financial aid from tuition program. Additionally, $500 was provided to each entering freshman student for computer support. In 2015-16 we raised $2.64 million in new scholarship support. These funds were donor directed either to our scholarship endowment for ongoing future support and/or to the creation of 15 new scholarships with year-to-year funding commitments.

- **Financial Aid Counseling -** To assist prospective and current veterinary students with financial aid and scholarship applications, and money management guidance, the school has developed an extensive web site of information and resource links (www.vetmed.ucdavis.edu/students/financing_education/index.cfm). Additionally, we contract with the campus for a designated financial aid officer to assist our students with financial aid

eligibility and applications, provide guidance on the school's scholarship opportunities, and offer debt management counseling and planning.

Professional Career Services:

- **Career and Networking Night -** An annual event for students to meet and network with veterinary professionals in private/corporate practices, industry partners and veterinary association representatives. Students are able to explore externships, internships, and full-time employment opportunities, and obtain cutting-edge information on veterinary products/services.

- **VetMedJobs -** The online job board launched in January 2015 has been extensively used, at no cost, by students, alumni and employers. To date, 949 students and alumni and 500 employers are registered. More than 550 jobs, externships, internships, and seasonal positions have been posted. Traffic to the site has been robust with more than 3,223 unique visitors and 5,920 total visits since its inception. (www.vetmed.ucdavis.edu/students/clw/career/externship_job_search.cfm)

- Professional Network - The network acts as a catalyst connecting current UC Davis DVM students to professionals who represent a wide variety of fields of veterinary medicine. (www.vetmed.ucdavis.edu/students/clw/career/professional-network.cfm)

MULTI-DISCIPLINARY SCIENTISTS COLLABORATE ON CUTTING-EDGE INNOVATIONS

Dr. Derek Cissell (left), one of eleven faculty participants, discusses veterinary-related innovations at this year's Biomedical and Engineering Entrepreneurship Academy (BMEA) conference. As part of the strategic effort to build strong collaborations with academic and business partners, the school co-sponsors the BMEA along with the university's Biomedical Engineering Department, School of Medicine, Office of Research and the Child Family Institute for Innovation and Entrepreneurship.

A springboard for moving research out of the lab and into the world, this academy has opened many doors for veterinary scientists looking to transform their research into real life applications. Gathering with other campus scientists for the annual three-day academy in July, veterinarians and researchers learned the building blocks of entrepreneurship by utilizing networking opportunities, seminars and interactive workshops, and mentoring sessions with industry executives and investors. Topics at the BMEA included technology commercialization, intellectual property, new business development and building a network to move ideas forward.

One such innovation to be born from the BMEA is Expanesthetics, a start-up established by veterinarian Dr. Robert Brosnan and UC Davis alumnus Mark Holman, a veteran entrepreneur and business owner in Davis, who was serving as a BMEA mentor when they met. Dr. Brosnan, an expert in veterinary anesthesia in the school, brought groundbreaking technology to the academy in hopes of finding a way to mainstream the product since its potential could benefit hundreds of millions of human and animal patients. Holman was so impressed with Dr. Brosnan's research that he licensed the intellectual property from the university, recruited clinical and scientific advisory boards, elected a board of directors and has brought investors aboard to move the innovation forward.

CANCER THERAPIES FOR DOGS MAY SPEED THE DEVELOPMENT OF NEW TREATMENTS FOR HUMANS

Melanoma, lymphoma, gliomas — all of these types of cancer affect both dogs and people. For that reason, dogs make excellent models for better understanding not only how cancer forms in humans, but also in developing more efficient treatments.

For example, Dr. Michael Kent, a radiation oncologist with the UC Davis School of Veterinary Medicine, collaborated with Dr. Arta Monjazeb, a radiation oncologist at the UC Davis Comprehensive Cancer Center, to examine the use of a novel therapy in treating advanced metastatic disease in dogs. Metastatic tumors are those that have already spread to other parts of the body beyond the main tumor site, which make them the most challenging to treat. By combining conventional radiation and immune therapies for the first time in a canine clinical trial, they were able to improve effectiveness of the treatment, and extend the lives of some dogs while maintaining quality of life. Their study results recently appeared in the journal *Clinical Cancer Research*.

BIZARRE BACTERIA CAUSING MAJOR CATTLE DISEASE NAMED BY UC DAVIS RESEARCHERS

After more than 50 years of research, the tick-borne bacterium responsible for one of the most troubling and economically devastating cattle diseases in the western United States has been named and genetically characterized by UC Davis researchers.

"This is a most unusual bug, a 'Ripley's Believe It or Not' bacterium, and the tick that carries it is equally bizarre," said veterinary immunologist Jeffrey Stott, who has led the effort to develop a preventive vaccine for foothill abortion disease.

Using an electron microscope, Stott and colleagues physically examined the bacterium in tissue sections taken during postmortem exams of aborted calves. They then characterized it by partially sequencing three of its genes and named it "*Pajaroellobacter abortibovis*," recognizing the Pajaroello tick that carries the bacterium as well as its abortion-inducing impact on infected cows and their fetuses. The findings of this study are reported in the August 30 issue of the journal *Veterinary Microbiology*.

The disease, which occurs in California's coastal mountains and the foothill regions, southern Oregon and northern Nevada, annually results in the death of an estimated 45,000 to 90,000 unborn calves. Vaccine trials to prevent the disease are now in the second year, thanks to a longtime partnership between UC Davis, the University of Nevada, Reno, and the California Cattlemen's Association. During the first year, some 9,000 heifers throughout California were inoculated with the live vaccine several months before they became pregnant. The current vaccine appears to be more than 95 percent effective in preventing the infection in pregnant cows and their fetuses and may provide lifetime immunity for the vaccinated cows.

"The Pajaroello tick is as intriguing as the disease-causing bacteria it carries," Stott said. Unlike more common ticks that burrow their way into the skin of people and animals to feed, the Pajaroello is a soft-

bodied tick and does not embed itself in its hosts. Instead, the Pajaroello lives in the decomposing plant litter at the base of trees, shrubs and rocks. It is attracted to cattle by the carbon dioxide the animals give off. Only once every few months, the tick makes the effort to pierce the cow's skin and feed on its blood for about 20 minutes. Once in the cow's tissue the bacteria travels to the cow's uterus; in cows and other ruminants, no antibodies are passed between the mother and the fetus. As the fetus matures, it begins to develop an immune system, eventually triggering an immunological response to the presence of the bacteria. The fetus essentially destroys itself and usually dies about four months after the cow is infected.

ADVANCED TRAINING PROGRAM MAKES WORLDWIDE IMPACT

Beyond providing clinical training to DVM students, the veterinary hospital also plays an important role in training veterinarians to become board-certified in a specialty field. The veterinary hospital's house officer program, which offers residencies, internships and fellowships, is the largest of its kind at any veterinary hospital in the country. The program routinely attracts candidates from around the globe; currently veterinarians from 19 foreign countries (on six continents) and 21 states are enrolled. Since 2010, it has drawn participants from 32 countries and 39 states, as well as the District of Columbia and Puerto Rico.

The hospital annually sees more than 50,000 patients, providing extensive caseload for advanced training. The house officer program currently trains 109 veterinarians – 99 residents, seven interns and three fellows. Their one- to four-year appointments provide opportunities in 34 specialty disciplines (more than any other veterinary hospital), including cardiology, dairy production medicine, oncology, radiology, dentistry and oral surgery, anatomic pathology, dermatology, marine mammal medicine, ophthalmology, livestock medicine, zoological medicine, and behavior.

In addition to hands-on advanced clinical training, the program also provides additional educational and research opportunities. Many house officers are required to complete a research study and present that project at the annual Gerald V. Ling House Officer Seminar Day in March. By including international veterinarians in the program faculty are raising the quality of veterinary care throughout the world.

ENGLISH BULLDOG'S GENE POOL MAY BE TOO SMALL TO HEAL THE BREED

English bulldogs, beloved for their typically childlike personalities, are prone to a number of congenital health problems created by a lack of diversity in its gene pool to make much-needed health improvements. In the first broad-based assessment of the breed's genetic diversity using DNA rather than pedigrees, the UC Davis team has confirmed earlier assumptions and provided a new glimpse of how many large regions of the genome had been altered over more than five centuries of breeding that focused primarily on changing the dog's appearance.

“We were taken back by how little ‘wiggle room’ still exists in the breed for making additional genetic changes,” said lead author and distinguished professor Niels Pedersen of the UC Davis School of Veterinary Medicine’s Center for Companion Animal Health.

He noted that although English bulldog breeders are managing the breed’s limited genetic diversity in the best possible manner, many individual dogs today are the products of extreme inbreeding. Findings from the new study are published today (July 28) in the journal Canine Genetics and Epidemiology.

The English bulldog was known to have originated in the early 1600s from a small genetic base. Its ancestors are thought to have been mastiff-type dogs, bred in Asia for strength and aggressiveness. The breed underwent several artificial genetic bottlenecks — severe reductions in gene pool size — over the centuries, as breeders manipulated the dog’s appearance from that of a strong, ferocious “bull baiter” in bull rings of England to the iconic household pet of today. The breed was first recognized by the American Kennel Club in 1886.

Health problems common to the breed:

- The health problems of the English bulldog have been well documented and extend from conception through adulthood.
- The breed ranks second in congenital diseases and related deaths among puppies, due mainly to a number of conformational birth defects such as flat chests, splayed legs and cleft palates.
- Brachycephalic, or short-headed, syndrome, which produces upper respiratory problems, is a leading cause of health problems and deaths among English bulldogs.
- The breed also is prone to chondrodysplasia, a skeletal disorder that may result in hip and elbow dysplasia as well as other joint and spinal problems.
- Numerous other health problems are common to the breed, involving the dogs’ teeth, skin, heart, eyes and immune system.
- These congenital health problems are reflected in the English bulldog’s lifespan, which has a median length of just 8.4 years.

PROTECTING THE INTEGRITY OF CALIFORNIA HORSE RACING

For more than four decades, a unique partnership between California’s horse racing industry and the school has fostered the safety of racehorses in the state, continues to ensure the integrity of the sport, and promotes the continuous advancement of equine athletic medicine. This relationship is recognized worldwide as a model for public and private sector cooperation in the conduct of horse racing and has demonstrated California’s capacity for visionary leadership.

Since the late 1970s, research has been conducted at the Center for Equine Health and other campus facilities to protect the health of race horses. In 1999, the school added the Kenneth L. Maddy Equine Analytical Chemistry Laboratory. Created through legislative mandate, this laboratory provides routine drug testing and quality control to ensure the integrity of racing in California. Additionally, its scientists conduct research into the effects of drugs on racing performance and the long-term health of horses. They develop new technologies to study the pharmacology of therapeutic medications, work with the veterinary pharmaceutical industry to investigate new animal drugs, and provide information, continuing education and recommendations on pharmacology-related issues.

The Maddy Laboratory now serves as the primary equine drug testing laboratory for California's five permanent race courses and seven seasonal fair venues. The laboratory is equipped to detect more than 1,500 drugs in its routine testing. It was one of the first horse racing laboratories accredited by the American Association for Laboratory Accreditation and Racing Medication and Testing Consortium, based on the World Anti-Doping Association model. Its staff runs approximately 70,000 samples a year, looking for evidence of performance-enhancing and other prohibited drugs.

GLOBAL ONE HEALTH DAY - NOVEMBER 3, 2016

On November 3, individuals and groups from around the world, from academic to corporate and non-profit organizations, students to established professionals, will have the opportunity to implement One Health projects and special events under the auspices of "One Health Day." Projects will highlight the benefits of a One Health transdisciplinary approach towards solving today's critical global-planetary health challenges. One Health is a movement to forge co-equal, all-inclusive collaborations, in both research and applied sciences, between human and veterinary medical healthcare providers, social scientists, dentists, nurses, agriculturalists and food producers, wildlife and environmental health specialists and many other related disciplines. At UC Davis, the One Health Day activities will extend across three days:

- **Thursday, November 3rd:** The One Health Institute and School of Veterinary Medicine will be joining colleagues from around the world while staying on the Davis campus by live-streaming and interactively joining One Health Day events in other national and international locations.

- **Friday, November 4th**: The Students for One Health will host a panel discussion to give current veterinary students a chance to interact with several experienced faculty members and PhD students on educational and career choices that enhanced their ability to work in One Health fields.

- **Saturday, November 5th**: The Students for One Health and the One Health Institute are hosting the *2016 UC Davis One Health Symposium*. The theme of this year's symposium is "Collaboration in the Face of a Changing Environment." Discussion topics will range from Zika virus and the distribution of mosquitos and other vectors, to respiratory disease caused by environmental particulates, to disaster preparedness and response. The deans of the UC Davis Schools of Nursing, Medicine and Veterinary Medicine will give the day's capstone address.

EQUINE VETERINARIANS WARN OF PISTACIA POISONINGS

In the fall of 2013, following the acute deaths of five mares from a large herd, two surviving mares were brought to the veterinary hospital after two days of lethargy and icterus. The deceased horses had varying degrees of colic, ataxia, pigmenturia, pale and icteric mucous membranes, lethargy and inappetance. All died within 48 hours of initial signs.

While the Equine Medicine Service team worked to save the two mares, one of the veterinarians on the case, resident Dr. Rana Bozorgmanesh, started researching the cause of the deaths. She and the team, along with members of the toxicology department, discovered that the sick horses had access to a planted *Pistacia* orchard (containing the species *P. atlantica*, *P. terebinthus*, and *P. chinensis*) following the fall harvest. There were no recent changes in herd management or housing, except for the felling of the *Pistacia* orchard shortly before the first horse developed clinical signs; the owner had witnessed the

horses eating from trees that had been cut down. Other horses on the property that were not allowed access to the orchard did not exhibit any signs of illness.

A site visit by Dr. Bozorgmanesh, along with veterinary students and staff, was performed to inspect the property for possible toxin exposure. Sampling of the water, hay, trees, and vegetation was conducted to investigate potential intoxication as the cause of hemolytic anemia, usually associated with an oxidant toxin such as maple trees, onions, or other plants associated with oxidant damage or hemolysis in horses. None of these were found on the property.

"While the horses had access to the trees throughout the remainder of the year, we propose the problem lies with the felled and wilted leaves," said Dr. Bozorgmanesh, who ultimately became the lead author on this groundbreaking clinical research. "The felled trees in the California outbreak would have allowed for easy access and ingestion of large quantities of wilting leaves and seeds by the horses, thus accentuating these effects."

UPCOMING CONTINUING PROFESSIONAL EDUCATION

- September 24-25 Fall Festival, UC Davis
- October 23-27 Explorer Series, Milan ITALY
- November 5 One Health Symposium, UC Davis
- November 6 Feline Forum, UC Davis

Registration information and the full CE calendar is available at : http://www.vetmed.ucdavis.edu/CE/

RECENT NEWS

Do Stem Cell Treatments for Racehorses Hold the Key to Healing Human Athletes?
http://www.comstocksmag.com/longreads/hard-cell

Care of UC Davis Exotics Specialists Help Return Bald Eagle to Wild
http://www.vetmed.ucdavis.edu/whatsnew/article.cfm?id=3610

California Developing Equine Biomarker Program
http://www.bloodhorse.com/horse-racing/articles/214352/california-develops-equine-biomarker-program

Dr. Sue Stover Selected for University of Kentucky Equine Research Hall of Fame
http://www.vetmed.ucdavis.edu/whatsnew/article.cfm?id=3596

Virus Hunting: Dr. Jonna Mazet Heads Global Effort to Avert the Next Ebola or Zika Outbreak
http://www.sacbee.com/news/local/health-and-medicine/article92997847.html

Common California Culex Mosquito Could Amplify Zika Spread
http://www.sacbee.com/news/local/health-and-medicine/healthy-choices/article92034182.html