

VETERINARY MEDICINE

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One World, One Health

Recognizing that humans, animals and their environment are inextricably linked, the school takes a One Health approach to educating veterinarians, conducting research through its many centers and programs, and providing training and outreach to communities.

Approximately 75 percent of emerging human infectious diseases are shared with animals. Hantavirus, Ebola, West Nile, salmonella, E. coli, malaria, leptospirosis, plague—each of these illnesses is carried into human populations through animals; each of them can kill or at the very least cause serious ailments.

"We have an increasing need to educate veterinarians to deal with zoonotic diseases that impact public health and the way we manage our environment," said Dean Michael Lairmore. "By

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One Health recognizes that the health of this woman in Tanzania is interconnected with the cows from her village and the water they all drink.

Got DNA? We've Got Answers

Hundreds of packages arrive daily at the school's Veterinary Genetics Laboratory (VGL). They hold samples of cheek swabs, blood and hair—all packed with DNA that can reveal parentage, the presence of inherited diseases, desired genetic traits and even clues to forensic cases.

For breeders, the VGL offers valuable tools to avoid passing along inherited

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diseases that can either prove fatal or negatively affect the health of the animal. Other tests identify characteristics such as coat color, fur type and ancestry. While providing services for clients, VGL research also advances DNA testing by developing new assays and conducting studies related to the population health of wildlife species, thereby advancing the well-being of domestic and wild animals.

In the past year, the VGL has developed 12 new tests, including those for:

Alaskan Husky Encephalopathy (AHE)— a fatal brain disease affecting juvenile and young adults that includes seizures, trouble walking and eating, a high stepping gait and vision problems. AHE is inherited as a simple autosomal recessive trait; the DNA test can determine if dogs are normal, or if they carry one or two copies of the defective gene. Dogs that carry two copies of the mutation are expected to develop neurological problems.

- Burmese Head Defect—a recessive mutation, discovered by the School's Lyons Feline Genetics Research Laboratory, which causes a fatal congenital craniofacial defect in Burmese cats. The test can determine whether a cat carries the genetic mutation.
- Burmese Hypokalemia— a recessive genetic defect characterized by episodes of low serum potassium levels and high creatine phosphate kinase, an enzyme that indicates muscle damage. Clinical signs include episodes of skeletal muscle weakness. Affected cats usually can be managed by adding potassium supple-

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ments to their diets. Breeds at risk include: Burmese and outcrosses such as burmilla, Bombay, Cornish rex, devon rex, singapura, sphynx, Australian mist, tiffanie, and tonkinese.

- **Familial Enamel Hypoplasia of Italian Greyhounds** (**FEH**)— characterized by enamel pitting and tooth discoloration; often teeth are unusually small, pointed and prone to increasing gaps between teeth with age. It is estimated that 14 percent of this breed are affected with FEH and 30 percent are carriers.
- Horse Embryo Pre-Implantation Genetic Diagnosis (PGD)— a procedure used to screen embryos to determine genetic traits prior to implantation in a surrogate mare. The test allows selection of those embryos that are free of known genetic diseases, thus maximizing the outcome of the embryo transfer process.
- Cattle A2 Genotyping—identifies animals that produce milk containing A2 beta casein, a protein variant considered to have health benefits. Test results are critical to implement breeding programs for production of A2 homozygous animals.

When the VGL launched 50 years ago, it primarily provided parentage verification for cattle registries. Over the years, the VGL has expanded its services to provide animal parentage verification for a variety of species, forensic testing, genetic diagnostics and genetic disease research. For several decades, the VGL has been a leader in equine genetic research and remains at the forefront of DNA testing for cats and dogs.



By using DNA samples derived from skin, blood and hair, the Veterinary Genetics Laboratory can confirm parentage for breed registries, identify animals that carry genetic diseases and even help with criminal investigations. Researcher Tamala Gilliland prepares samples for PCR analysis.

The International Society for Animal Genetics recognizes the VGI's parentage tests as international standards, and its forensic unit was the first accredited crime lab dedicated to animal DNA profiling under the American Society of Crime Laboratory Directors/Laboratory Accreditation Board International program.

For more information about any of these tests, please visit the VGL at www.vgl.ucdavis.edu or call (530) 752-2211.

Injection-site Sarcomas in Cats Get Another Look

In the early 1990s, veterinarians reported that cats that had received multiple vaccination injections over time appeared to develop sarcomas at the sites of the injections. While the cancerous tumors are rare, the phenomenon raised concerns among veterinarians and cat owners.

The American Veterinary Medical Association formed the Vaccine-Associated Feline Sarcoma Task Force in 1996. In 2001,

the group issued new guidelines for veterinarians that, while following legal requirements, emphasized individualized vaccination plans and offered specific tactics to reduce the risk of vaccine-associated sarcomas. A decade later, doctoral candidate Anup Srivastav, working with collaborators in the school and advised by veterinary epidemiologist Philip Kass, has compared associations between different types of vaccines and other injectable drugs, with the development of injection-site sarcomas in cats. A study was published in the *Journal of the American Veterinary Medical Association* in September 2012.

Using a questionnaire sent to veterinarians, the team analyzed 436 cat cases pulled from a pathology database. Veterinarians contributed injection history and mapped locations of tumors in patients.

Associations with Specific Drugs

The authors "efficiently detected associations" between sarcoma development and administrations of different types of vaccines (recombinant and inactivated rabies, for example), as well as

One World, One Health

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integrating holistic ecosystem health training into the veterinary curriculum, we can promote a more global and preventive approach to public and animal health."

As part of the Master of Preventive Veterinary Medicine degree offered by the school, students have the opportunity to take courses on the epidemiology of zoonoses and vector-borne diseases, food safety and veterinary public health, and infectious diseases in ecology and conservation.

The school's Wildlife Health Center (WHC) operates several One Health programs that integrate environmental health with that of animals and humans. For example, the WHC is a core partner of PREDICT—a collaborative project to build a global early warning system to detect and reduce the impacts of emerging diseases that move between wildlife and people. PREDICT is currently active in Africa, South Asia, Southeast Asia and Latin America.

In addition, WHC researchers and others from the U.S. and Tanzania collaborate on a project known as HALI—Health for Animals and Livelihood Improvement. The effort investigates zoonotic transmission of tuberculosis and other pathogens among wildlife, livestock and people through funding provided by the U.S. National Institutes of Health. Last year, the HALI team created a wildlife health handbook to assist park rangers, game scouts and park staff to safely recognize, investigate, report and respond to diseases that could impact wildlife conservation and human health.

other injectable medicines such as corticosteroids and antibiotics. The authors further state that their findings indicate that "no vaccine is entirely risk free."

Co-author Kass, among the first to document the epidemiological evidence that indicated a causal relationship between vaccination and the formation of tumors in cats, reminds pet owners that vaccine-associated sarcoma in cats is a rare occurrence.

The study findings, however, are having an impact. Kass states, "The implications of this paper are already rippling through the vaccine industry." Future studies will be required to evaluate specific recombinant vaccines and other drugs for their potential to raise the risk of tumors.

While problems can occur when gathering survey information from medical records over the long term and from several sources, the authors agree that epidemiological studies are the only tool to monitor the causes and incidence of injection-site sarcomas over time.



Hunger Pains

Stanley Marks, a professor in the School of Veterinary Medicine, has produced a documentary entitled "Hunger Pains." This 12-minute film highlights four canine patients who were diagnosed with swallowing disorders and treated at the William R. Pritchard Veterinary Medical Teaching Hospital. In a great example of One Health, Marks collaborated with Dr. Peter Belafsky, MD, Medical Director of the Voice and Swallowing Center at the UC Davis Medical Center to treat the dogs. Beyond the treatments, the documentary depicts the mutual commitment humans and animals have toward one another, spotlighting a bond that runs deeper than most know how to describe. The video can be seen on YouTube at www.youtube.com/ucdavisgastro.

Closer to home, the Western Institute for Food Safety and Security (WIFSS) based at UC Davis partners with multiple state and federal institutions to ensure a safe and secure food supply, grow the nation's agricultural economy and protect public health. WIFSS has developed a comprehensive food security defense training plan and certified courses that the institute—a designated training partner of the Department of Homeland Security—delivers as part of statewide agroterrorism-response training.

By bringing together animal and human medical professionals at the annual Zoobiquity conference—a joint project between UCLA's David Geffen School of Medicine and the UC Davis School of Veterinary Medicine—future veterinarians and physicians gain an understanding and appreciation for the way that both fields can learn from each other. Medical professionals present cases where their patients (animal and human) suffer from the same disease and discuss treatment approaches.

"It is important that we share our expertise and work together to advance better health for all species," said veterinarian Cheryl Scott, director of the Calvin Schwabe One Health Project.

Researchers at the school's Regenerative Medicine Laboratory are pioneering the use of stem cell therapy toward treatment of orthopedic injuries and joint disease in horses and dogs and share new knowledge that will benefit other species, including humans. This group works closely with colleagues at UC Davis School of Medicine.

These are just a few examples of the school's projects, programs and teaching activities that use the One Health approach to advance the health of animals, people and the environment.

New Faculty

Bruce W. Christensen

Assistant Professor of Equine Reproduction; Population Health and Reproduction

Education

- MS, Reproductive Physiology, Cornell University, 2007
- DVM, Cornell University, 2002

Experience

- Assistant Professor of Clinical Reproduction, Iowa State University, 2008-2012
- Visiting Professor in Equine Reproduction, Australia, Cayman Islands, Hungary, 2007-2008
- Staff Clinician, Cornell University, 2007
- Resident, Equine and Canine Theriogenology, University of Florida, 2003-2006
- Internship, University of Florida, 2003

Special Interests

- Reproductive issues in the preservation of endangered species
- Studies of Mexican gray wolves, okapis, Somali wild asses, Fennec foxes, African elephants



Ghislaine Dujovne

Associate Staff Veterinarian and Health Sciences Clinical Professor in Equine Reproduction; Population Health and Reproduction

Education

- MS, Auburn University, 2011
- Diplomate, American College of Theriogenologists, 2010
- DVM, University of Chile, 2004

Experience

- Clinician, Theriogenology, Auburn University, 2011-2012
- Resident, Theriogenology, Auburn University, 2008-2011
- Veterinarian and Resident, Chilean Thoroughbred Breeders, 2007-2008
- Teaching Assistant, University of Chile and Universidad Santo Tomás, Chile, 2006-2007

Special Interests

• Clinical reproduction in equines and other species, including South American camelids (alpacas, llamas), small ruminants and small animals

The Journey Through Foaling Season

One of the sweetest images in veterinary medicine is a newborn foal taking its first steps. Getting to that point can be quite the experience for horse owners, though. At the school, equine specialists are committed to every aspect of that journey. From advanced reproduction services to foaling and post-foaling care, the veterinary team covers all the bases with an integrated approach to the foaling season.

The journey starts with the Equine Reproduction Service at the William R. Pritchard Veterinary Medical Teaching Hospital (VMTH). In conjunction with the Center for Equine Health (CEH), the VMTH provides routine and advanced reproductive care for mares, including but not limited to: diagnostic work-ups on infertile mares, artificial insemination, ultrasonographic pregnancy diagnosis, twin reduction, pregnant mare care and obstetrics. Also available are advanced reproductive technologies, including embryo transfer.

Additionally, stallion services include fertility evaluation, investigation of infertility, breeding management, semen collection and evaluation, preparation and shipment of cooled semen, freezing of semen, and collection and freezing of epididymal sperm.



A newborn foal is treated by veterinarians and staff at the Neonatal ICU.

After a successful pregnancy, the journey continues to the foaling period. For owners of healthy mares wanting help with the birth, the CEH offers foaling care for up to two weeks prior to birth. Foaling stalls are equipped with closed-circuit cameras, and the night staff continues around-the-clock monitoring to ensure



Welcome new faculty

Kevin Keel

Associate Professor of Anatomic Pathology; Pathology, Microbiology and Immunology

Education

- PhD, Pathobiology, University of Arizona, 2004
- Diplomate, American College of Veterinary Pathologists, 2002
- DVM, University of Georgia, 1997
- MS, Wildlife Biology, University of Georgia, 1993

Experience

- Assistant Research Scientist/Supervisor of Diagnostic Services, Southeastern Cooperative Wildlife Disease Study, University of Georgia, 2004-2012
- Anatomic Pathologist, Arizona State Veterinary Diagnostic Laboratory, 2000-2004
- Resident, Anatomic Pathology, UC Davis, 1997-2000

Special Interests

- Emerging diseases of wildlife
- Pathogenesis of infectious disease
- Facultative pathogens and factors contributing to disease progression

optimal care. Following foaling, both mare and foal are given health checks from VMTH veterinarians.

For high-risk pregnancies, the VMTH offers similar foaling services, where the mares are closely watched by veterinarians and technicians. This option provides a closer watch of the mare and monitoring of the foaling process. Should any problems arise for the mare or the foal, VMTH veterinarians are ready.

Occasionally, a foal is born with complications or develops them soon after foaling. Examples include low birth oxygen, neonatal maladjustment syndrome (also termed "dummy foal" syndrome), septicemia and prematurity. The Lucy G. Whittier Neonatal Intensive Care Unit (NICU) at the VMTH can handle the most complicated cases with facilities and experts to care for the equine world's newest additions. These patients are provided 24/7 support by a team of dedicated and highly-trained faculty specialists, residents, technicians and nurses. The NICU is equipped with customized stalls to support sick foals, allowing intensive management under the watchful eye of the mare in an adjoining stall.

By providing this cutting-edge clinical care, the school is dedicated to making that sweet image of a healthy foal taking its first steps a reality for all horse owners wanting to welcome the next equine generation. For more information about foaling services or to schedule an appointment call the Large Animal Clinic at (530) 752-0290.



Sun Young Kim

Assistant Professor of Clinical Small Animal Orthopedic Surgery; Surgical and Radiological Sciences

Education

- MVSc, Seoul National University, South Korea, 2002
- DVM, Seoul National University, South Korea, 2000

Experience

- Resident, UC Davis, 2009-2012
- Internship, University of Florida, 2008-2009
- Internship, Michigan State University, 2004-2005
- Resident, Veterinary Teaching Hospital, Seoul National University, 2000-2003

Special Interests

- Orthopedic biomechanics
- Quantitative gait analysis for diagnosis of lameness in dogs

Kathryn Koehler

Assistant Clinical Professor of Veterinary Ophthalmology; Surgical and Radiological Sciences

Education

• Diplomate, American College of Veterinary Ophthalmologists, 2002



• DVM, UC Davis, 1998

Experience

- Associate Veterinarian, UC Davis, 2008-2012
- Associate Ophthalmologist, Animal Eye Center, Rocklin, California, 2002-2008
- Associate Ophthalmologist, Animal Eye Center, Fremont, California, 2002-2005
- Resident, Comparative Ophthalmology, UC Davis, 1999-2002

Special Interests

- Ophthalmic surgery
- Ocular manifestations of systemic disease



New Fellowship Expands Learning Opportunities in Veterinary Dermatology

A generous bequest from the estate of Dr. George H. Muller of Concord, California, has established a new endowed fellowship in veterinary dermatology.

The George H. Muller Veterinary Dermatology Fellowship will provide support for junior faculty and residents to expand their learning opportunities in this specialty. The estate's gift of \$200,000 created an endowment to provide enduring support for the fellowship.

"Dr. Muller had a lifelong dedication to learning, selfimprovement and the field of veterinary dermatology. The fellowship is a fitting tribute to his dedication," described Steven Anderson, trustee for the estate. "Even though sadly Dr. Muller has passed away, his devotion to veterinary medicine lives on through the many individuals he has inspired to become veterinarians, technicians and researchers. His great love of animals has left this world a much better place to live."

Dean Michael Lairmore expressed gratitude for this visionary gift. "Dr. Muller's fellowship invests in the next generation of veterinary dermatologists and supports our commitment to educating and training tomorrow's world leaders in veterinary medicine."

Muller was widely recognized as the father of veterinary dermatology. In 1956, he and his wife Opal established the Muller Veterinary Hospital in Walnut Creek. For 25 years, he focused his practice on dermatology, thereby establishing the first full-time, small animal dermatology practice in the world.

Throughout his career, Muller advanced the understanding of dermatology. He captured more than 6,000 clinical photographs and wrote the first edition of *Small Animal Dermatology* in 1969. He published other books, numerous articles and chapters on

Alumni: We'd Like to Hear from You!

We're launching a new database system that will help us better communicate with alumni. This alumni database will allow you to update your contact information and connect with other alumni, tell us about your additional educational and work experience, and offer advice to current students. Please watch for an email from the school letting you know how to access and use this system. To ensure that we have your most current information, visit:

www.vetmed.ucdavis.edu/alumni/alum-update.cfm

We look forward to hearing from you!



Steven Anderson (center) presents Dean Michael Lairmore and Stephen White a check from the estate of George Muller, establishing an endowed fellowship in his name. Widely recognized as the father of veterinary dermatology, Muller wrote the book, *Small Animal Dermatology*, which is held by Lairmore.

small animal dermatology. Muller presented over 150 lectures around the world, including dermatology seminars at the annual American Animal Hospital Association meeting for 18 consecutive years. He was co-founder of the American Academy of Veterinary Dermatology in 1964 and its president in 1968. He was also the co-founder of the American College of Veterinary Dermatology and served as its president in 1980. Muller was instrumental in helping to establish the European Society of Veterinary Dermatology. He received numerous awards and tributes for his work.

"Dr. Muller was able to combine expertise, imparting of knowledge and a gentle manner that made him an extraordinary clinician, researcher, teacher and colleague," said Stephen White, professor and chief of the Dermatology Service, at the William R. Pritchard Veterinary Medical Teaching Hospital.

His presence in veterinary dermatology was known around the world. Muller established the highly successful "Postgraduate Symposium of Veterinary Dermatology" at Stanford University. It is now sponsored by the school and known as the "George H. Muller-Peter Ihrke Veterinary Dermatology Seminar."

"George Muller was respected, admired, loved and indeed revered everywhere that veterinarians or physicians had an interest in the skin diseases of animals," added Peter Ihrke, professor emeritus in the Department of Medicine and Epidemiology.

For information about making a gift to the George H. Muller Fellowship in Veterinary Dermatology, please contact the Development Office at (530) 752-7024.

THANK YOU NOTES

Strategic Planning Update

he strategic planning initiative L to guide the school toward its vision of leading veterinary medicine and addressing societal needs has been organized around seven major goals and involves 19 different strategic teams. For example, activities in support of the goal of educating world leaders in veterinary medicine include the following:

Admissions: Implementation of the new DVM student admissions process, which modifies the way applicants are initially ranked and interviewed. The new process uses the science GPA, the quantitative GRE score, a quantitative evaluation method called the Personal Potential Index. and the Multiple Mini Interview (MMI) format, which has replaced the traditional interview

format.

The Seven Strategic Goals

- Educate world leaders in academic veterinary medicine
- Perform high-impact transdisciplinary research
- Develop cutting-edge clinical programs
- Promote animal and human well-being
- Maintain school infrastructure and sustainable resources
- Retain excellent faculty and staff
- Promote academic, government, industry collaboration

- **Graduate Education:** The creation of a new vision for DVM graduate education, alternative educational paths for academic careers focused DVM students, the identification of resources to fund highquality graduate students, and support for students transitioning between resident training and graduate research training.
- Educational Delivery Methods: Advancing the understanding of educational methodology and the impact of a veterinary curriculum's delivery on a student's learning process and career path choices.
- Teaching Academy: Participation in the development of a teaching academy (train-the-trainer) by the newly formed Consortium of Western Regional Colleges of Veterinary Medicine, consisting of five universities.
- **Center of Excellence:** Faculty, dairy practitioners, dairy producers and animal health pharmaceutical representatives participated in a two-day strategy meeting at the Veterinary Medicine Teaching and Research Center in Tulare to discuss the development of a Western Regional Center of Excellence in Dairy Production Medicine.

These and many other activities are included in the quarterly progress reports which have been posted on the Strategic Planning web site at: www.vetmed.ucdavis.edu/strategic_planning/index.cfm

2012 Distinguished Service Award

Curriculum: Planning and implementation of curriculum

includes completion and implementation of the spring

revisions for DVM and graduate student instruction. This

semester for the DVM 2nd year; planning completion for

the DVM 3rd year, initiation of planning for the extended

essential competencies for new DVM graduates.

4th clinical year, and a survey of stakeholders regarding the

For more than 15 years, Ron Foster (left) has assisted the school-as adviser, fundraiser, benefactor and corporate collaborator-and significantly enhanced its teaching, research and service missions. In recognition of his contributions, Dean Michael Lairmore (right) presented the president and CEO of Foster Farms with the school's 2012 Distinguished Service Award at the school's annual fall reception in October.





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Dean's Regional Visits

Dean Lairmore looks forward to meeting with alumni and friends throughout California in a series of visits with regional chapters of the California Veterinary Medical Association.

On September 23, the dean enjoyed his visit with the Marin VMA at a welcome reception hosted by alumni Grace Bransford, DVM 1998; Jim Clark, DVM 1988 (left); and Jeff Boehm, DVM 1990 (right).

Also in attendance from Davis: veterinarians Tristan Burgess and Tracey Goldstein and current veterinary students Nina Akana, Colleen Geisbush, Christine Haas and Mike Ramos.

Dean Lairmore is also scheduled to visit with the Southern California VMA on February 27, the Alameda VMA on May 29 and Contra Costa VMA on June 10. Look for more information from your local chapter and on the school's website at www.vetmed.ucdavis.edu/alumni.







Veterinary Continuing Education (530) 752-3905, Fax: (530) 752-6728 center4cpe@ucdavis.edu

February 2, 2013 – 27th Annual Charles Heumphreus Memorial Lecture

For information on this and other 2013 events, please visit www.vetmed.ucdavis.edu/ce.

Seeking New Associates?

Looking to add a stellar team member to your veterinary practice? The school produces an annual directory of graduating seniors with a summary of each student's career and educational focus, as well as descriptions of their special training and other experiences. Licensed veterinarians seeking associates for their practice may access the Class of 2013 Student Directory at:

www.vetmed.ucdavis.edu/students/placement_services

Employers may also post career positions and part-time job openings on this site at no charge. Questions? Contact symplacement@ucdavis.edu or (530) 752-1383.

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