

Dedicated to Discovery

At the UC Davis School of Veterinary Medicine, research fuels discoveries that transform the health of people, animals and the environment. UC Davis leads the nation's 28 veterinary schools in research funding and attracted 209 grants and contracts totaling \$67.2 million in the past fiscal year (2012-2013). More than 30 percent of that research funding came from the National Institutes of Health. Key areas of research at the school include:

FOOD SAFETY—Foodborne illness outbreaks in the U.S. alone annually sicken around 48 million people and kill approximately 3,000. The 100K Genome Project is on the forefront of limiting the spread of microorganisms such as *Salmonella* and *E. Coli* by identifying their genetic structure. To date, researchers have sequenced the genomes of 1550 foodborne disease-causing pathogens. The Western Institute for Food Safety and Security (WIFSS) enhances food safety from farm to table—including dairies, produce fields, processing plants, restaurants and other sites. Through partnerships with the FDA, UC Davis researchers train farm investigators to track foodborne illness outbreaks. WIFSS is also one of the first Department of Homeland Security emergency response programs dedicated to food supply emergencies caused by acts of agro terrorism or accidental contamination.

AUTISM—Researchers from the Center for Children's Environmental Health investigate how exposure to toxic compounds may combine with genetic predisposition to alter brain development and lead to autism. This is the first federally funded center to perform basic and translational science to better understand this neurodevelopmental disorder. Partners in this novel effort include the U.S. Environmental Protection Agency, the National Institute of Environmental Health Sciences and the UC Davis M.I.N.D. Institute.

DIABETES—Scientists in the Department of Molecular Biosciences are helping the health profession understand and identify strategies for preventing and treating type 2 diabetes, which affects more than 21 million people in the United States. Molecular bioscientists also discovered that adults who consume excess sugar face significantly higher risks of heart disease. Based on the study, the authors suggest that U.S. dietary guidelines for sugar should be reconsidered.

SEIZURE DISORDERS—As part of the NIH Countermeasures Against Chemical Threats Research Network, the UC Davis CounterACT Center of Excellence identifies medical countermeasures for neurotoxic chemicals that cause seizures in humans and animals. Research findings from this \$17 million research center could also improve medical treatment for people with seizure disorders.

TRANSLATIONAL MEDICINE—UC Davis leads the nation in conducting veterinary clinical trials for the prevention, diagnosis and treatment of cancer, brain tumors, heart disease and other conditions through its Veterinary Center for Clinical Trials. These trials aim to advance medical care for animals and, in some cases, humans. Results from specialized veterinary studies in dogs enabled physician-scientists at UC San Francisco to introduce a novel therapy for glioblastoma into phase-one clinical trials in humans. Translational researchers received acknowledgment in 2013 by the National Cancer Institute for "unique and noteworthy scholarly contributions in the field of cancer drug development."

CLINICAL INNOVATION—The Dentistry and Oral Surgery team collaborated with UC Davis biomedical engineers to regrow jawbones in dogs that have lost bone to injuries or removal of cancerous tumors. To date, 17 dogs have undergone this novel reconstructive procedure (along with one bearded dragon). Knowledge gleaned from carrying out the procedure in these clinical cases promises to provide valuable information for biomedical treatments in both human and veterinary medicine.

ZOONOTIC DISEASES—Diseases that move between wildlife and people can lead to devastating outbreaks such as the H1N1 flu pandemic in 2009. PREDICT, a project of USAID's Emerging Pandemic Threats Program led by the school's One Health Institute, brings together international experts in veterinary medicine, epidemiology, wildlife ecology, virology, genetics and other specialties to create a global early warning system for these zoonotic illnesses. The program is active in 20 countries that are emerging infectious disease hot spots.

CSI UC DAVIS—Animals can be the victim, perpetrator or witness of a crime and often leave genetic evidence at the scene through blood, hair or saliva. The Veterinary Genetics Laboratory Forensic Unit assists federal, state, and local law enforcement agencies solve crimes through animal DNA profiling. As part of one of the largest animal DNA testing laboratories in the world, VGL Forensics is the first accredited crime lab dedicated to animal DNA.

ANIMAL HEALTH AND SAFETY—Bovine respiratory disease, including pneumonia, is the leading natural cause of death in U.S. beef and dairy calves, causing the loss of more than one million animals and \$700 million annually. A team of veterinarians and other scientists at the Veterinary Medicine Teaching and Research Center (VMTRC) is conducting a study to prevent, diagnose and treat bovine respiratory disease. The VMTRC is also home to one of the four California Animal Health and Food Safety System laboratories —the backbone of California's warning system that helps to protect the health of California's livestock and poultry and safeguards the public health with rapid and reliable diagnoses for animal diseases affecting humans.

EQUINE WELFARE—Injuries, breakdowns and associated medical treatment contribute significantly to the cost of the California horseracing industry with millions of dollars lost annually through forced retirements and fatalities. Collaboration among equine veterinarians, biomedical engineers and racetrack personnel has enabled the J.D. Wheat Veterinary Orthopedic Research Laboratory to measure some of the main factors of track composition (including dirt, turf and synthetic) that influence equine health. Observations in the field and lab are helping the industry build the safest racecourses.

Innovative research through a One Health approach at the UC Davis School of Veterinary Medicine leads veterinary medicine and addresses the societal needs of animals, people and the environment. Robust research initiatives like these create knowledge that enhances the school's high-quality teaching program and leads to novel patient care advances in the clinical services of the teaching hospital.