



Chica playing at the UC Davis veterinary hospital. She is enrolled in a clinical trial to treat her heart disease.



Young **AT HEART**

To see Chica run through the grass before her appointment at the UC Davis [veterinary hospital](#), one would never suspect that she has heart disease. The 12-year-old Shih Tzu mix has the energy of a puppy, and her cardiologists want to keep it that way. They've enrolled her in a [clinical trial](#) to assess the efficacy of a cardiac drug that may keep her young at heart.

With statistics showing the high prevalence of heart disease in animals, it's imperative that veterinary cardiologists not only develop better treatments, but also improve diagnostics and utilize research to help identify heart disease early, before symptoms appear. Chica's participation in a clinical trial is just one of many projects funded by donor gifts to the [Center for Companion Animal Health \(CCAH\)](#) to advance heart health in multiple species.

Efforts in Prevention

As in humans, heart disease is one of the leading causes of animal deaths. Hypertrophic cardiomyopathy (HCM) is the most common feline cardiac disease, affecting approximately 1 in 7 cats. In dogs, 75 to 80 percent of small breeds over the age of 10 will develop degenerative mitral valve disease; large breed dogs also develop heart disease. Thanks to CCAH grants, cardiologists are able to research these diseases and others to discover better treatments and ways to prevent them from happening in our beloved companion animals.

Heart disease is one of the leading causes of animal deaths.



UC DAVIS
VETERINARY MEDICINE
Center for Companion Animal Health

A Message from **THE DIRECTOR**

Our clinicians treat an array of health issues every day—in dogs, cats, birds, rabbits and other companion animals. Behind the scenes, our residents, fellows, clinical faculty, translational and basic science researchers create better ways to prevent, diagnose and treat those health problems.

In this newsletter, we focus on our cardiology team and their efforts to improve how we tackle heart disease, which is common in dogs, cats and other species. By taking a team approach to look at everything from genetics, diet, imaging and new drugs, we make an impact on how cardiac disease is treated in our pets. These are the types of studies your contributions fund and why your support is needed.

I also wanted to highlight the advances we're able to make in research and treatment with new equipment. For example, you'll read how our neurology team uses a precise computer-based neuronavigation unit in treating epilepsy in dogs, conducting safer brain biopsies and even pioneering pituitary tumor removal in cats. None of this would be possible without your support.

Science and research are the keys to advancing companion animal health and we will continue to work for all species to live healthy, long lives with their families. It's the reason we are here and the reason we are proud of and humbled by your support and trust.

All my best,



Michael S. Kent, MAS, DVM, DACVIM, DACVR
Director, Center for Companion Animal Health



For the **LOVE OF ANIMALS**

Marit Marino has made a tremendous impact on the school over the years—initially as a dedicated volunteer and client of the veterinary hospital, and later as a philanthropic partner. She has donated to the CCAH for nearly two decades.

“The wonderful canine companions I have enjoyed over the years have found a special place in my heart and sparked my commitment to supporting the CCAH,” Marino said. “Flint (pictured on right) is a fantastic dog and has a great personality. I thoroughly enjoy showing him in competition as I did with my Doberman pinschers in earlier years.”

During the 1990s, she drove an hour each way to and from her home in the San Francisco Bay Area to volunteer on weekends at the veterinary hospital. She also helped organize annual Saturday lecture events at the school, which were open to the public.

In 1997, when one of her Dobermans, Percy, became paralyzed, she was referred to the veterinary hospital. After two months of treatment, Percy was able to walk again. Marino is grateful for the care he

received and committed to giving back by supporting the CCAH. In addition to donating, she gifted a beautiful art sculpture of a Doberman that clients can see on the second floor of the CCAH.

Marino has also worked with organizations to rehabilitate and adopt dogs that no one else wanted. In 2004, she rescued an aggressive Doberman from the Tassajara Veterinary Clinic in Danville, California, where she met her current veterinarian, Dr. Elisa Dowd (DVM '87). Through her love and patience, Marino has transformed once unadoptable dogs into remarkable companions.

Marino, who at one time considered becoming a veterinarian, said the inherent goodness in dogs inspired her to include the CCAH in her estate plans, ensuring that the impact of the [Koret Shelter Medicine Program](#) and the genetics program will continue for generations to come.



Dr. Kate Hurley, director of the Koret Shelter Medicine Program (left), and Marit Marino, holding her French bulldog, Flint, share a commitment to the health and well-being of animals.

Navigating **THE BRAIN**

Dr. Beverly Sturges reached into her surgeon's toolbox for another bolt and screw to secure Oberon's head frame. A large mixed-breed dog, he was undergoing neurosurgery to replace electrical leads implanted in his brain as part of a clinical trial to predict and treat canine epilepsy.

But first, the headframe, like a metal halo around his skull, needed to be situated to stabilize his cranium. As a neurosurgeon, Sturges requires millimeter precision. Her next tool—a computer-assisted navigation unit—would give her that accuracy.

Thanks to the generosity of donors to the CCAH, a \$120,000 BrainSight neuronavigation system is now available to UC Davis veterinarians for a variety of clinical and research purposes, including Oberon's surgery.

This neuronavigation unit allows targeting of specific areas in the brain and spinal cord by marrying MRI technology to 3D space with respect to the patient. Surgeons are able to use this stereotactic imaging to locate their target from an external standpoint and see through the surface of the animal.

Currently, the neurology team has used the system for a variety of applications:

- Obtaining brain biopsies with greater precision than previously possible
- Delivery of therapeutics into specific areas of the brain
- 3-D navigation during surgery (pituitary and other cranial surgeries)
- Implantation of medical devices

“If this clinical trial proves successful, it will revolutionize treatment for people with epilepsy. But we couldn’t do this project if we didn’t believe it was helping these dogs along the way.”

– Dr. Beverly Sturges

The new navigation tool has allowed Dr. Pete Dickinson to refine his treatment of canine brain tumors.

“Taking a brain biopsy to determine the type of tumor we’re dealing with is more challenging in the brain than other organs, and we need to take care to minimize damage to the normal brain,” Dickinson said. “While UC Davis pioneered clinical stereotactic imaging in dogs during the 90s to perform biopsies, this next generation of systems takes us to an advanced level and allows us to be more exact.”

The system also helps guide Sturges and Dickinson when they perform a surgery to remove a brain tumor and then guides them to the best location to deliver therapeutic drugs.

Dr. Chai-Fei Li, assistant professor of neurology, is pioneering the use of this neuronavigation system to remove pituitary tumors in cats—a challenging location to access given that the pituitary gland sits at the base of the brain.

“This technology expands our accuracy and makes the surgery safer,” said Li, who is leading a trial through the school’s [Veterinary Center for Clinical Trials](https://www.ccavetmed.ucdavis.edu/clinical-trials) to treat feline pituitary tumors.

For Oberon, the dog with epilepsy, the neuronavigation system enabled Sturges and team to implant deep brain stimulating electrodes that first determined when he was most likely to have a seizure; then they were used to treat him proactively. While the clinical trial is ongoing and results have not yet been statistically analyzed, Sturges said his owners have reported a decrease in seizures and improved quality of life.

“If this clinical trial proves successful, it will revolutionize treatment for people with epilepsy,” Sturges said. “But we couldn’t do this project if we didn’t believe it was helping these dogs along the way.”

▶ Dr. Beverly Sturges relies on the BrainSight neuronavigation system for precision during neurosurgery.



New Hope for **TREATING CANINE UTIs**



Recurring urinary tract infections (UTIs) in your canine companion can be frustrating to deal with—especially if they don't respond well to traditional antibiotic treatment due to antimicrobial resistance. Fortunately, veterinary researchers may soon have a new tool to treat these painful and pesky infections.

Drs. Jodi Westropp and Jane Sykes from UC Davis partnered with Dr. Gilad Segev of the Koret School of Veterinary Medicine in Israel to conduct a pilot study using an asymptomatic strain (ASB) of *E. coli* 212, rather than an antibiotic, to treat recurrent UTIs (dogs with more than three infections in one year with clinical signs).

"We were looking for a novel therapeutic approach to prove efficacy and safety," Westropp said.

They modeled their approach after research conducted by Drs. David Klumpp and Anthony Schaeffer at Northwestern

◀ Zoe was a dog in the pilot study to test efficacy of using asymptomatic *E. coli*. She has remained free of infections.

Young at Heart Continued from page 1

Dr. Josh Stern seeks to identify the genetic causes of common inherited heart diseases in dogs, such as subaortic stenosis (SAS), which has no effective treatment and can lead to sudden death. SAS is inherited across many dog breeds, including the golden retriever, Rottweiler, Newfoundland and Bouvier. CCAH funding has been instrumental in helping his lab develop novel genetic tests to identify the biomarkers of SAS, allowing breeders to avoid this deadly disease.

CCAH funding also enabled the [Cardiology Service](#) to conduct a clinical trial that identified a role for personalized medicine—using a patient's genetic makeup to understand the best treatment options.

Better Treatments

Pimobendan, a drug used to delay the onset or treat congestive heart failure in dogs and cats, is the subject of several current projects funded by CCAH donors.

One study showed a novel mechanism by which pimobendan may help cats and identified it as safe, re-evaluating what was previously identified as a potential side effect. This discovery may change the way that cardiologists treat cats with HCM (see page 5).

Pimobendan is also being studied in dogs. In research demonstrating that the drug is beneficial in delaying the onset of heart failure by 15 months, researchers also discovered that the smaller the pimobendan made the

heart (i.e. the better the patient responded to the drug), the better the outcome. Advancing that discovery, Dr. Catherine Gunther-Harrington is studying if higher doses of pimobendan will further improve heart function.

Along with its ability to augment heart function, pimobendan may improve kidney function. In conjunction with the higher dose study, Dr. Lance Visser and resident Dr. Joanna Kaplan are testing the effects of pimobendan on kidney function (This is the study in which Chica is enrolled).

Dr. Gunther-Harrington is also working with the school's exotic animal veterinarians to determine proper dosing and drug levels of pimobendan in rabbits, data yet to be documented in veterinary medicine.

Improving Diagnostics

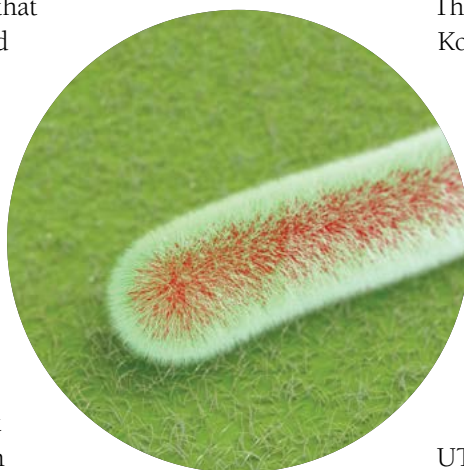
CCAH also funds resident research into alternative ways to diagnose heart diseases. These include assessing the severity of pulmonic stenosis, a congenital heart defect, which also helped puppies from shelters and lower income families receive vital care and treatment. Another project evaluated the reliability of various methods to measure heart chamber size, an important means to help cardiologists determine severity of disease, decide when to initiate treatment, and to gauge prognosis in dogs with degenerative mitral valve disease (see page 5).

CCAH's donor funding of these faculty and resident grants all lead toward the goal of advancing cardiac medicine and training future cardiologists.

University where mice models showed that asymptomatic *E. coli* not only combatted UTIs, but provided greater pain relief effects as well.

“The mechanisms by which ASB *E. coli* provides protection for recurrent UTI are not yet fully understood,” Westropp said. “They may be due to modulation of the immune system or bacterial interference, whereby the ASB strains colonize the bladder and prevent colonization with more virulent strains of *E. coli* that cause inflammation and result in lower urinary tract signs.”

Westropp and team were able to study the safety and efficacy of using ASB *E. coli* 212 in nine dogs with recurrent UTIs. Instead of using antibiotics, they sedated the dogs and instilled 10 ml of *E. coli*. Based on subsequent cultures and voiding diaries, four out of the nine dogs had clinical and microbial cures, two had initial good results but then had a re-infections and two failed.



E. coli

The collaborative team of UC Davis and Koret researchers recently received a Morris Animal Foundation grant to enroll a larger cohort of 50 dogs and run the trial through the school's Veterinary Center for Clinical Trials. Westropp credits donors to the CCAH for funding the pilot study needed to pursue this larger grant.

“In this multicenter, randomized trial, we aim to further study the effects of ASB *E. coli* 212 in a larger group of dogs with not only recurrent UTI, but also in patients that have strains of bacteria that are resistant to most common oral antimicrobials available,” Westropp said. “This novel therapy could have significant positive impacts for veterinary medicine, allowing us to decrease the use of antimicrobials, thereby decreasing selection of antimicrobial resistant bacterial strains.”

Cardiology Residents WIN NATIONAL RESEARCH AWARDS

CAH resident grants have been instrumental in training the next generation of specialty clinician scientists. Thanks to those grants, two cardiology residents recently won Resident Research Awards at the 2019 American College of Veterinary Internal Medicine (ACVIM) annual conference. As one of the largest veterinary conferences in the world, ACVIM receives resident research submissions from some of the best and brightest minds in veterinary medicine.

Second-year resident Dr. Weihow Hsue's research project—“Reliability of Measuring of Left Atrial Size in Dogs with Subclinical Myxomatous Mitral Valve Disease”—may better guide veterinarians on evaluating and monitoring the disease's severity, which will aid important treatment decisions and help assess prognosis.

Third-year resident Dr. Maureen Oldach's research project—“Acute Pharmacodynamic Effects of Pimobendan in 22 Client-Owned Cats with Hypertrophic Cardiomyopathy”—revealed that the drug improved heart function and may improve prognosis in cats. Data assessment also revealed that pimobendan did not lead to malpositioning of the heart valve, which

could lead to transient blood flow obstruction, a previously suspected potential side effect.

These awards showcase the school's worldwide leadership in academic research and clinical training. UC Davis is one of the only veterinary hospitals in the world that offers a research intensive cardiology residency training program. Residents complete a four-year program (rather than a traditional three-year residency) which includes an entire year devoted to clinical research.

Learn more about [residency programs](#) at UC Davis.

Dr. Weihow Hsue (left) performs an echocardiogram on a patient in the hospital's cardiology suite. ▶



Sharing the Science of **GOOD HOUSING**

Imagine you are a cat placed in an animal shelter where the enclosure is cramped, near loud, barking dogs and your food dish is next to your smelly litter box. Scary and stressful, right? Humans had the chance to experience that at Animal Care Expo, the nation's largest conference for animal shelter professionals, thanks to a clever exhibit created by the [Koret Shelter Medicine Program \(KSMP\)](#).

"Even though a shelter stay is temporary, to an animal who lives in the moment it can feel like an eternity," said KSMP Director Dr. Kate Hurley. "Inadequate housing causes stress, which can lead to disease, forcing an animal to stay longer at the shelter until it recovers and taxing the shelter's limited resources. This in turn can prevent another animal from entering the shelter, and lead to a vicious cycle that may end in euthanasia."

For 18 years, the KSMP team at the CCAH has been advocating and advancing the evolution of shelter operations based on their experience and the latest scientific research. They have found that the best way to keep cats and dogs as healthy and relaxed as possible in a shelter environment is to provide adequate housing. In single-cat cages, that means space to stretch, a place to hide, separate compartments for food and litter, proper lighting and ventilation, quiet, a variety of surfaces, and something to look at beyond the cage walls.

What better way to bring home that message than create an exhibit where humans can experience a facsimile of the feline experience? After enduring a minute in the Bad Cat Housing Challenge—complete with foul-scented candles,



An example of bad housing in the exhibit.

the sound of barking dogs, food next to a toilet and kitty litter sprinkled on a bed—exhibit visitors emerged on the other side to find state-of-the-art good displays for housing individual cats and groups, along with tips on sanitation and enrichment.

The exhibit was created as part of the [Million Cat Challenge](#) outreach, a five-year collaborative campaign to help shelters save a million cats.

"We surpassed our first goal a year early," Hurley said. "Since then, our shelters have already saved another million lives, bringing our total to

2 million cats and counting."

In addition to the exhibit, the KSMP team created a guidebook, "Do It Yourself Accessories for Animal Shelters." This compendium provides a wealth of projects to create beds, climbing structures, hiding spaces, and toys using cheap and easily-available materials. If you'd like to try out your handicraft skills or share this with your local shelter, download the guide at sheltermedicine.com/diy.

Dr. Kate Hurley and her friend Jackson Galaxy from Animal Planet, in front of good cat housing. ▶



GIFTS from the Heart

Are you looking for a heartfelt way to show that you care? Honor someone special—a beloved pet, friend or family member—with a donation made in their name to the [Companion Animal Remembrance and Endearment \(CARE\) fund](#). When you make a donation, we will brighten your honoree's day with a letter sharing your meaningful tribute.

By giving to the CARE fund, you support studies that improve the health of our animal companions. Please visit give.ucdavis.edu/Go/care or call 530-752-7024.

Thank You



July 1, 2018 to June 30, 2019

We're so grateful for our donors! Thanks to you, we are making great strides in companion animal medicine—in areas such as preventing and treating heart disease in cats and dogs, helping homeless animals by teaching shelters best practices in housing, and investing in equipment to advance research. Your philanthropy enables us to make a difference in animal health. We are pleased to recognize donors who contributed \$1,000 or more to the Center for Companion Animal Health from July 1, 2018 to June 30, 2019.

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HIGHLIGHTS

of Donor-Funded CCAH Research Studies

With your support we have just funded over 35 new grants to advance companion animal health. Here are a few of these studies that will have impact:

- Treating Myasthenia Gravis with stem cells in dogs
- Examining wildfire effects on clotting in cats
- Unlocking the genetics of bladder cancer in dogs
- Growing new cartilage to treat arthritis in dogs

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