UC DAVIS VETERINARY MEDICINE
Center for Companion Animal Health

CCAH Update

Summer 2014

CCAH: At the Forefront of Helping Prevent and Cure Animal Diseases

Dear Friends:

Impact—this is what CCAH is all about. With your support, we remain at the forefront of funding studies that help prevent and cure animal diseases. In this issue, we share exciting news about three recent CCAH-funded efforts that are breaking new ground in veterinary medicine. Dr. Danika Bannasch has found the genes responsible for cleft palate in dogs, which will help us test for—and even eliminate—this disease. Dr. Boaz Arzi is using stem cells to address a debilitating feline illness that—until now—has been extremely difficult to treat. And Dr. Danae Wagner's approach to the design of cat housing in animal shelters is reducing the stress and suffering of homeless animals and increasing their adoption rates. Again, this is direct impact.

Our donors and partnering animal hospitals also create impact by giving us the resources needed to carry out our work. Inside, we profile one of our longest supporters, Mary Seawright, who recently passed away. Mary was an amazing woman who had direct impact on my life (I was a scholarship recipient of hers in 1996, when I was in veterinary school) and the lives of countless children and animals in California. She will be greatly missed, but through her endowment she will continue to do good in this world.

And new impact awaits: we are currently in the process of giving out our next cycle of grants, totaling more than $500,000. I look forward to reporting to you the results of this new wave of pioneering studies in future issues.

My best,

Michael Kent, MAS, DVM
Director, Center for Companion Animal Health

Also in this issue:

CCAH-Funded Study: Using Stem Cells to Treat a Debilitating Feline Disease

When Cyndi Luke's family cat, Lilli, was five years old, she suddenly developed trouble eating and began rapidly losing weight. A trip to the local veterinarian revealed devastating news. Lilli's mouth was filled with painful, open sores—the primary symptom of feline chronic gingivostomatitis (FCGS), a debilitating inflammatory disease that can be extremely difficult to treat, let alone cure.

While the cause of FCGS is unknown, its standard treatment is drastic: a full-mouth tooth extraction, which cures about 80 percent of cases. For cats that don't respond to this treatment, the inflammation of their gums and oral cavity persists, leaving them to face a lifetime of advanced pain management. "It's the most horrible cat disease, and every doctor we saw said so," explains Luke.

After her stem cell treatment, Lilli (pictured here), age 12, "started playing and acting like a kitten again," says owner Cyndi Luke.

The Lukes were quickly referred to UC Davis Veterinary Medical Teaching Hospital, where Lilli's teeth were removed by the Dentistry and Oral Surgery Service, which sees several cats a month with the disease. Unfortunately, Lilli's symptoms endured. She was put on steroids, and eventually morphine. Her weight dropped to five pounds.

The Luke family spend five long years trying to find help for Lilli. "Every treatment was hit and miss—it worked with some cats some of the time," recalls Luke. "But with Lilli, nothing worked."

Two years ago, just as Luke and her husband started talking seriously about putting Lilli down, they received a call from Dr. Boaz Arzi, an assistant professor in the Dentistry and Oral Surgery Service. Dr. Arzi had received a CCAH grant to pursue a new kind of treatment for FCGS using stem cells extracted from a cat's own fat tissue—and he was hoping that Lilli might join the study. The Lukes quickly said yes.

Arzi's theory was that the stem cells could "jumpstart" the immune system and reduce the inflammation in cats that hadn't responded to tooth extraction. Stem cell therapy has been used in both human and veterinary medicine for a variety of inflammatory diseases—but it had never been used to treat FCGS.

"If we could reverse their poor immune status, we believed that cats affected by the disease could have a pain-free quality of life with normal mouth health," explains Dr. Arzi, who served as the study's principal investigator. "Essentially, they'd be cured."

Lilli didn't respond to the first treatment, but the second treatment brought incredible results: she started getting better. Within three months, her mouth was lesion-free, she was off all medication, and she'd doubled her weight. "She started acting like a kitten again, playing with toys and chasing bugs," says Luke. "We couldn't believe it."

While Dr. Arzi and fellow researchers Dr. Dori Borjesson and Dr. Frank Verstraete are still fine-tuning their protocol, the CCAH-funded study has already made a significant contribution to feline oral health, revolutionizing the understanding and treatment of a disease that, until now, has caused horrible pain for so many cats. Dr. Arzi is already fielding inquiries from veterinarians and cat owners all over the U.S., eager to learn more about this new treatment option. Says Dr. Arzi: "Refining the treatment will be one of the most valuable tools in the arsenal for veterinarians."

Meanwhile, Lilli, who just turned 12, continues to thrive. "This study changed our life," says Luke. "There is nothing more heartbreaking than watching an animal suffer, and now we don't have to."

Bannasch Genetics Lab Finds Link to Cleft Palate

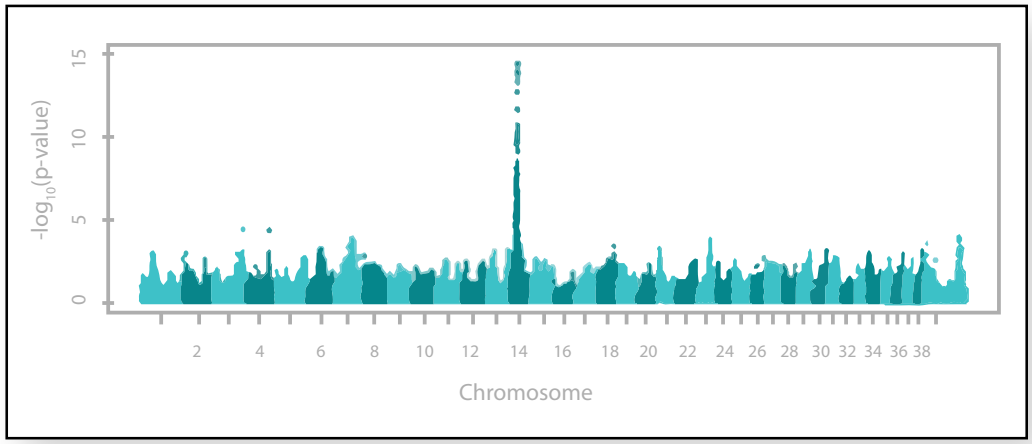
A few years ago, Dr. Danika Bannasch, a professor of genetics in the UC Davis School of Veterinary Medicine's Department of Population Health and Reproduction, started wondering why Nova Scotia Duck Tolling Retrievers—a type of dog that she herself breeds—seemed to have a high prevalence of cleft palate. "I noticed that a lot of breeders said they had cleft puppies," says Dr. Bannasch. "I thought there must be a genetic basis for it in this breed."

Cleft palate is a birth defect that causes inadequate sucking and swallowing, and many puppies die of starvation due to their inability to nurse. Surgical repair can be done between two and three months of age, but it is a costly and complicated medical procedure.

A CCAH research grant enabled Dr. Bannasch to find the genetic mutation that causes the deformity in this specific breed. As it turns out, about 15 percent of Nova Scotia Duck Tolling Retrievers carry the mutation. The discovery will allow a genetic test to be designed and offered to breeders so that they can make more informed breeding decisions.

Meanwhile, the discovery also enabled Dr. Bannasch to apply for—and receive—funding from the National Institutes of Health (NIH) to conduct further research on the genetics of cleft palate beyond just this breed. "That's the beauty of CCAH funds," says Dr. Bannasch. "They let you get the preliminary data that can then transform into a much larger grant."

"This is an example where doing the research in one small breed is going to launch greater research," adds Dr. Bannasch. "Now we have the funds to study this in all dog breeds—and even to help clarify the genetic basis for the disease in humans."



The above plot depicts statistical analysis of genetic markers used to identify the genes responsible for cleft palate in Nova Scotia Duck Tolling Retrievers. Note the tall peak on chromosome 14, which is where the gene responsible for cleft palate is located.

Genetic Discoveries in the Pipeline

The CCAH continues to help fund exciting new research studies designed to find the genetic roots of a range of diseases that impact the lives of animals. Donor support helps make these studies possible. Below are just a few of the gene-based diseases that our researchers are tackling right now:

- Rare blood types in cats
- Hypertrophic osteodystrophy in Weimaraner's (bone disease)
- Myasthenia gravis in dogs (nervous disorder)
- The genetic basis of cancer in ferrets
- Subaortic stenosis in Newfoundland dogs (heart disease)
- The genetics of brain tumors in dogs

Dr. Mary Silan Seawright

A Legacy of Dedication to Education and Animals

Dr. Mary Silan Seawright was a longtime friend of the School of the Veterinary Medicine and an ardent supporter of veterinary education. As an elementary school teacher for over 50 years, she was passionate about students and the value of education.

Dr. Mary Silan Seawright, pictured here with Dr. Michael Kent, established an endowed scholarship in her name to honor exceptional future veterinary leaders.

While sadly she passed away earlier this year, Dr. Seawright's legacy will live on through the Mary Silan Seawright Scholarship, which recognizes exceptional veterinary students interested in small animal medicine. Sixty-eight veterinary students have received scholarships since the fund was established in 1987.

One of the students honored was Michael Kent, who received the Seawright Scholarship in 1996. Dr. Kent has since become a member of the school's faculty as a radiation oncologist and the director of the Center for Companion Animal Health. He says, "I am very grateful to Mary for her scholarship award. She was truly a special person. Mary was extremely proud of all her scholarship recipients and kept letters she received from them over the years. She loved attending the school's annual awards ceremony and other events when her health allowed."

The endowed scholarship fund will continue to award scholarships in Dr. Seawright's name each year—making a difference for students as they pursue their dreams of becoming veterinarians. She will be fondly remembered in the hearts of the many students she taught, the veterinary students she supported, and those who are honored in the future.

Dr. Seawright also made an impact on advancing animal health through other gifts to the school. She generously contributed funds to support cancer research and the construction of the Center for Companion Animal Health building and the Veterinary Medicine Research Facility 3B.

Dr. Mary Silan Seawright generously contributed funds to support cancer research and the construction of the Center for Companion Animal Health building (left) and the Veterinary Medicine Research Facility 3B (right).

Helping Shelter Cats Thrive, One (Double) Cage at a Time

Countless cats in shelters across the country are living happier and healthier lives thanks to the continued work of Dr. Denae Wagner, an associate veterinarian with the UC Davis Koret Shelter Medicine Program, a donor-funded program that operates under the CCAH umbrella.

Two research studies conducted by Dr. Wagner and her colleagues—and funded by the Morris Animal Foundation with additional support from the CCAH—found a strong connection between the size and configuration of a shelter's cat cages and the health and well-being of the animals they house. Cats kept in traditional 2x2 foot cages lack the ability to keep their living and elimination spaces separate. They also have a much higher incidence of upper respiratory infection (URI), an illness often triggered by the stress of being handled and moved frequently while their cages are cleaned.

"URI is very common among shelter cats," Dr. Wagner explains. "Shelters have been plagued by the problem for so long that they've felt like there was nothing they could do about it." The solution, Dr. Wagner found, is double-compartment housing—essentially, two connected cages that give cats more space, enable them to be handled less frequently, and help cut down significantly on the incidence of URI.

> "I love hearing from little rural shelters that have modified their cages based on our instruction and advice."
>
> – Dr. Denae Wagner

So far, Dr. Wagner has helped dozens of animal shelters design new cat housing areas based on these findings. She has also created "portals"—round devices that can be installed between adjacent cages to turn two cages into one double-compartment cage—that enable shelters to remodel existing housing at very low cost. "I love hearing from little rural shelters that have modified their cages based on our instruction and advice," she says. "Our work remodeling on cat housing has touched hundreds of shelters, which is very gratifying."

Dr. Wagner is working hard to get these portals—which she makes herself out of PVC pipe— manufactured. Meanwhile, many of the cage manufacturers have shown interest in her work and are designing new cat housing for animal shelters as well. Says Dr. Wagner: "It is a key part of the overall picture of making life better for cats in all animal shelters."

Learn more about the impact of shelter design on animal health in our Q+A with Dr. Wagner, posted on the CCAH website: www.vetmed.ucdavis.edu/ccah/health_information/newsletter/news_supplements.cfm

Companion Animal Memorial Fund Spotlight — Dr. Wayne Berry

Dr. Wayne Berry is a renowned specialist in neurology and neurosurgery at the Southern California Veterinary Specialty Hospital in Irvine, California. Presented with some of the most complex cases, he helps patients using state-of-the-art technology and the gentle touch of compassionate care.

As a devoted pet owner, Dr. Berry understands the love that people have for their pets. "For me, one of the greatest rewards is being able to improve the lives of animals and in doing so, improve the quality of life of their owners."

So when a cherished pet passes away, it is important to Dr. Berry to help bring comfort to the grieving owner. He honors patients through the Companion Animal Memorial Fund at the center. "Memorializing a pet with a donation to the CCAH is a heartfelt way to express sympathy to my client and to convey that I care."

Clients are deeply moved by his thoughtfulness. One client wrote, "Thank you so much for the lovely card and the wonderful care you gave Kodiac. I miss him very much but the thoughtfulness of your card and then the kindness of your donation to UC Davis in memory of Kodiac touched me beyond words. Thank you!"

UC Davis is very special to Dr. Berry—he completed his residency at the School of Veterinary Medicine. He adds, "Contributing to the Companion Animal Memorial Fund provides a meaningful avenue of paying tribute to my clients and their pets, my school for the training I received, and supporting research efforts to improve the health of future patients."

Dr. Wayne Berry

"Memorializing a pet with a donation to the CCAH is a heartfelt way to express sympathy to my client and to convey that I care."

– Dr. Wayne Berry

This newly purchased cysto-urethroscope is being used in the clinic and in research to help animals

New Tools, New Possibilities

Conducting cutting-edge research often requires the use of highly specialized equipment not found in the average laboratory. In order to ensure that UC Davis veterinary researchers have the tools that they need to conduct and complete their studies, starting this year, the CCAH began offering equipment grants enabling researchers to either replace old devices or purchase much-needed new ones. In 2014, the CCAH funded nine equipment grants totaling more than $65,000. The devices purchased include a cysto-urethroscope, which allows veterinarians to examine body spaces under large magnification and obtain tissue samples without the need for surgery, and a Hallowell EMC Anesthesia WorkStation, designed to deliver anesthesia to small mammals such as rabbits and guinea pigs. The latter will be used both in research and for training residents in anesthetizing these unique species.

Linear Accelerator Update:
Pushing Cancer Care Forward

Radiation therapy is a key component in the treatment of many types of cancer—and part of our commitment to advancing the fight against cancer means having the best equipment available for treating our patients. Last year, the CCAH helped purchase a new linear accelerator—a device used to treat cancer in all parts of the body by delivering high-energy x-rays to tumors without damaging the healthy tissue around them. Indeed, our linear accelerator includes a built-in CT scanner that allows us to treat our patients' cancer even more precisely than we could before. It also includes the ability to track breathing motion, which enables us to compensate for motion during treatment and makes treatment even more accurate—down to a millimeter.

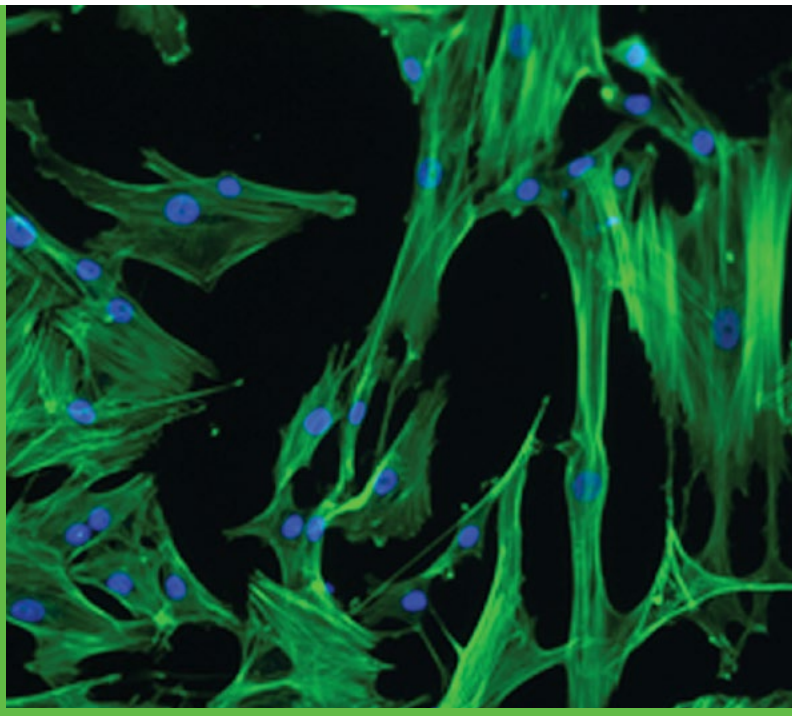
Our linear accelerator is a powerful tool for treating cancer in animals—and it's the only one being used to treat animals in the country. Installation of the machine finished ahead of schedule, and we began treating our first patients on the new machine last October. Since then, we have treated several hundred pets with cancer, including dogs, cats, birds, and horses. We are also using the machine for clinical and basic science research—irradiating cells to understand why some cancers are harder to treat than others, for example, and breaking up DNA to better map the cat genome. At present, we still need help in paying for this multimillion dollar piece of equipment. If you are interested in contributing, please go to www.vetmed.ucdavis.edu/development or call (530) 752-7024.

Bella being treated with radiation therapy for her brain tumor. UC Davis' linear accelerator is the only one of its kind being used to treat animals in the country.

Taking Stem Cells From an Idea to a Treatment

Stem cell research is a growing new field that holds incredible potential to help treat and cure animal illnesses. Your support is helping to fund basic science research into how stem cells work and how to use them to treat disease. Currently, CCAH-funded research studies are exploring the role and/or the use of stem cells in numerous areas, including:

- Feline gingivostomatitis (see Lilli's story on page 2)
- Knee diseases in dogs
- Inflammatory bowel disease in dogs
- Mandibular (jaw) reconstruction
- Brain tumors
- Better ways of administering stem cells to patients



Stem cells growing in culture

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c/o Office of the Dean—Development
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Davis, CA 95616-8734

International Conference on **FELINE HEALTH**

Please join us on the UC Davis campus on September 5–7, 2014.

This dual-track conference will delve deeply into feline health for pets, as well as animals in multi-cat environments such as shelters, sanctuaries, foster/rescue facilities, catteries, and free-roaming cats.

SESSION 1 is for cat breeders, cat lovers, shelter staff, and veterinarians seeking both knowledge and continuing education credits. This session will concentrate on problems in the multiple cat environments, with presentations by guest speakers. Session 1 will also be available on a live, interactive webinar. **Dr. Andrea Fascetti** will present the keynote address *"The Evolution of Artificial Feline Diets—Discoveries and Pitfalls Along the Way."*

SESSION 2 consists of scientific talks from submitted abstracts and is designed for veterinarians and researchers. Topics will be selected for their importance to feline health and for novelty. During this moderated session, presenters will be given 15 to 25 minutes, with five minutes for question and answers. The keynote address for this session will be *"The Conquest of Feline Leukemia Virus Infection"* by **Dr. Oswald Jarrett.**

Topics include: Vaccinology, shelter medicine, infectious diseases, and cat hoarding

For a complete program, the most up-to-date information, and to register, visit www.vetmed.ucdavis.edu/ce or call (530) 752-3905.

CCAH Update is published by the School of Veterinary Medicine at the University of California, Davis: Michael D. Lairmore – Dean, Michael Kent – Director, CCAH, Sharon Anglin, Celeste Borelli, Cheryl Cobbs, Don Preisler, Carolyn Sawai and contributor, Jenny Johnston.

The CCAH is dedicated to advancing studies in veterinary medicine—encompassing new ways to prevent, diagnose and treat diseases including cancers, genetic and immune disorders, infectious diseases, kidney and heart diseases, and nutritional disorders in companion animals. We welcome visitors to come and learn more about our mission and programs. To schedule a visit, please call (530) 752-7295.

Center for Companion Animal Health
Business Office: (530) 752-7295 Fax: (530) 752-7701
Small animal appointments: (530) 752-1393
vetmed.ucdavis.edu/ccah

For subscription questions, contact the Office of Development at (530) 752-7024 or development@vetmed.ucdavis.edu.