

New Technologies Impact Canine Health

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To truly advance the health of all dogs, the AKC Canine Health Foundation (CHF) looks for the latest technological discoveries that can be used in health research and veterinary medicine. Studies that apply technology from human medicine or use new machinery and methodologies to learn more about canine disease receive high innovation scores in CHF's proposal review process. And this approach has been worthwhile as several new technologies show promise in diagnosing and treating conditions such as infectious disease and cancer. Here's a sample of how these state-of-the-art tools may help dogs live longer, healthier lives:

Next Generation Sequencing

Next generation sequencing (NGS) identifies the nucleotide sequence of millions of small fragments of DNA at the same time. Bioinformatics analysis then pieces these small fragments together by comparing them to the reference genome or master sequence for that species. NGS can detect any and all kinds of variation in the nucleotide sequence for specific genes of interest or for all of a patient's DNA. It has the advantage of an unbiased approach, capable of identifying DNA sequences from as yet unknown organisms.

CHF-funded investigators have already used NGS to demonstrate that canine herpesvirus can spread across different geographic regions of the globe, with implications for the safe importation of dogs from outside the United States. NGS has been used to assess the efficacy of decontamination procedures for removing infectious organisms from the coat of working dogs. NGS is also being developed to detect vector-borne infections in dogs – those spread by insects such as ticks, fleas, and flies. Since co-infection, infection with more than one disease-causing organism, is common in dogs, NGS may help identify new vector-borne pathogens and determine which pathogen is most responsible for active clinical disease.

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In This Issue

- New Technologies Impact Canine Health
- Canines & Cocktails
- 2022 Clinician-Scientist Fellows
- 2021 Awards
- Recent Grant Highlights

Calendar of Events

Where to Find Us

March 11-13
 SAVMA Symposium
 Minneapolis, MN

March 12-13
 Tarheel Cluster
 Raleigh, NC

Upcoming Webinars

Register at akcchf.org/vetvine

Stay tuned for our
 2022 webinar schedule.



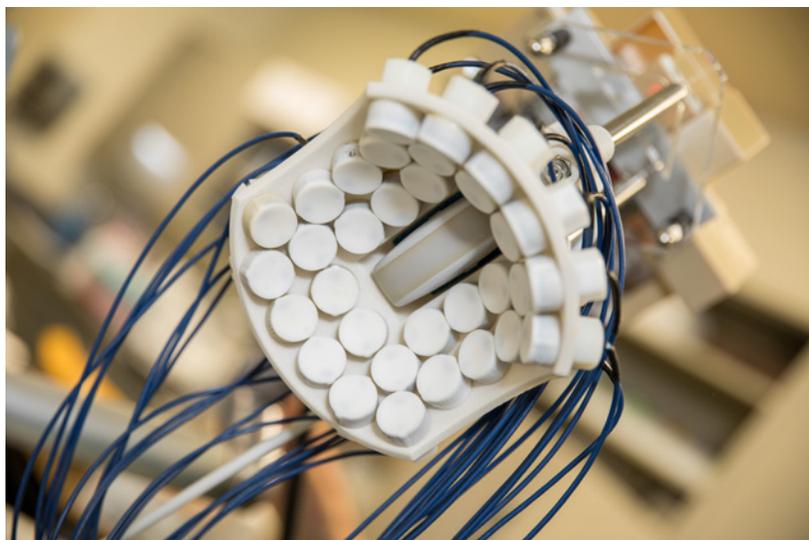
New Technologies Impact Canine Health *continued*

NGS has many uses other than infectious disease detection. CHF-funded investigators at PennVet used the technology to develop a test for 283 genetic mutations relevant to various canine cancers. Tests like this will allow clinicians to zero in on the genetic characteristics of each patient's cancer and choose a treatment with the best chance for success. NGS is also being used to identify genetic alterations associated with Cushing's disease (hyperadrenocorticism) and test new therapies for this common hormonal disease.

Histotripsy

Histotripsy is a non-invasive, focused ultrasound technique that uses controlled ultrasound waves to mechanically break down tissue. It can be applied to very precise locations and will not damage neighboring tissues. Once the targeted cells break down, their contents are exposed to the immune system which may then be able to mount a response against the desired tissue.

CHF-funded investigators at Virginia-Maryland College of Veterinary Medicine demonstrated that histotripsy can safely and effectively destroy canine bone tumors without damaging the surrounding muscles and nerves. While still experimental, this technique may provide a much-needed non-invasive treatment option for bone cancer in dogs. The technique is also being studied for other challenging cancers such as canine brain tumors.



Experimental histotripsy transducer used in canine bone cancer studies.
Photo credit: Dr. Tuohy, Virginia-Maryland College of Veterinary Medicine

Optical Coherence Tomography

Optical Coherence Tomography (OCT) uses near-infrared light waves to generate real-time, high-resolution images at a microscopic level. Since various tissues reflect this light differently, it can be used to distinguish normal and cancerous tissue. In human medicine, OCT has been used to image various tumors, evaluate surgical margins and lymph nodes for cancerous cells in real time, and more. CHF-funded investigators demonstrated that OCT is useful to differentiate canine tissue types such as muscle versus fat versus tumor. OCT is currently being evaluated as a tool to evaluate surgical margins and detect residual cancer cells present after removal of soft tissue sarcomas, skin tumors, and mammary tumors in dogs. The opportunity to provide real-time, accurate information about surgical margins could be a game-changer in canine oncology – facilitating more effective tumor removal in only one surgery.

Using new technologies in canine health research can rapidly improve our understanding of infectious diseases, cancer, and more. Explore CHF-funded research using these tools at akcchf.org/researchportfolio.



Thank you to our 2021 Canines & Cocktails Sponsors!



The 2021 Canines & Cocktails was a rousing success!

Guests enjoyed delicious food, entertainment by a Bee Gees tribute band, and special conversations with old and new friends. We provided a brief update on the many accomplishments achieved by CHF-funded researchers in 2021 and thanked our many sponsors. Thanks again to all who attended and thank you for your ongoing support of canine health research.

Thank you to Event Committee Chairs: Dr. and Mrs. William Truesdale.

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2022 AKC Canine Health Foundation Clinician-Scientist Fellows

Established in 2013, the AKC Canine Health Foundation's Clinician-Scientist Fellowship Program encourages and supports the next generation of canine health researchers to sustain future advancements in canine health. Visit akcchf.org/clinsci for more information. The 2022 fellows are:



Dr. Sarvenaz Bagheri is a combined neurology/neurosurgery resident at Washington State University College of Veterinary Medicine. Under the mentorship of Dr. Merbl, she will study the effect of N-Acetylcysteine on dogs with spinal cord injury.

This fellowship is generously sponsored by owners Carolyn and Gary Koch along with breeders Kristy and Kevin Ratliff in honor of "Rumble," GCHP Hill Country's Let's Get Ready To Rumble (akcchf.org/rumble).



GCHP Hill Country's
Let's Get Ready to
Rumble



Dr. Rachel V. Brady is a doctoral student in the Cell and Molecular Biology Graduate Program at Colorado State University. Under the mentorship of Drs. Duval, Dow, and Thamm, she will study genetic alterations that drive diffuse large B cell lymphoma as well as tumor and immune system interactions in osteosarcoma (bone cancer).

This fellowship is generously sponsored by the Orthopedic Foundation for Animals (OFA).



Dr. Lopamudra Kher is a doctoral candidate in the Small Animal Clinical Sciences Department of the University of Florida College of Veterinary Medicine. Under the mentorship of Dr. Domenico Santoro, she will continue to study the effect of signaling molecules associated with canine atopic dermatitis on *S. pseudointermedius* bacteria.

This fellowship is generously sponsored in part by the Westie Foundation of America.



MISSION: The mission of the American Kennel Club Canine Health Foundation, Inc. is to advance the health of all dogs and their owners by funding scientific research and supporting the dissemination of health information to prevent, treat and cure canine disease.



2021 AKC Canine Health Foundation Awards



The AKC Canine Health Foundation (CHF) presents the President's Award annually to persons or an organization that have made an exceptional contribution to advancing canine health. The 2021 President's Award recipients are **Dr. A. Duane and Connie Butherus**. Duane and Connie have devoted more than 50 years to dogs. From showing prize-winning Afghan Hounds to serving as officers for many clubs, they are dedicated to advancing the health and well-being of dogs. Dr. Butherus also serves on CHF's Board of Directors and Scientific Review Committee.

CHF also presents the Distinguished Research Partner Award annually to clubs or organizations for their ongoing and outstanding commitment to support canine health research. The 2021 Distinguished Research Partners are the **Australian Shepherd Health and Genetics Institute, Inc.** and **Retriever News/Entry Express**.

For more information on award recipients, visit akcchf.org/awards.

Recent CHF Grant Highlights

Grant 02952: Genetics of X-linked Progressive Retinal Atrophy in Greyhounds

Principal Investigator: Sara Thomasy, DVM, PhD; University of California, Davis

Identify the causal mutation for X-linked PRA in the Greyhound, determine its prevalence, and work towards development of a genetic test for this disease.

Grant 02946: Towards Curative Outcomes in Canine Hemangiosarcoma

Principal Investigator: Chand Khanna, DVM, PhD; Ethos Discovery

A multicenter, inter-disciplinary clinical trial to identify biomarkers and genomic subgroups of canine hemangiosarcoma and define new therapies to prevent cancer spread.

Grant 02912: Adoptive Natural Killer (NK) Cell Immunotherapy for Canine Lymphoma

Principal Investigator: William Kisseberth, DVM, PhD; The Ohio State University

A clinical trial using naturally occurring, cancer-fighting immune cells along with standard chemotherapy to treat lymphoma.

See our full research grants portfolio at akcchf.org/research.

How You Can Help

Support the AKC Canine Health Foundation to help find better treatments, more accurate diagnoses, and an improved understanding of the mechanisms that cause disease in dogs. Whatever your capacity to give, there is a way for you to help. Learn more at akcchf.org/how-to-help.



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