

# IN THE BEST OF HEALTH

## AKC CANINE HEALTH FOUNDATION CELEBRATES ITS 25TH ANNIVERSARY



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PHOTOS COURTESY OF AKC CHF  
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**S**ince its founding in 1995, the AKC Canine Health Foundation (AKC CHF) has been dedicated to advancing the health of all dogs by funding peer-reviewed research projects aimed to improve the health and well-being of our canine partners. Through a rigorous selection process, the AKC CHF funds only those projects that meet the highest scientific standards and have the greatest potential to benefit canines and their human companions. This One Health approach recognizes that all aspects of healthcare research have the potential to benefit both animals and humans as well as our shared environment. As the AKC CHF celebrates its 25th Anniversary, Dan Sayers sat down with CEO Diane Brown, DVM, PhD, DACVP to talk about some of the foundation's active research projects and to discuss everything from theriogenology and tick-borne diseases to the distinct appeal of "pupsicles" and red blood cells.

*Thank you for the taking the time to meet with me to talk about the AKC Canine Health Foundation. You're a veterinarian with a PhD, but you're also a DACVP (Diplomat of the American College of Veterinary Pathologists). Can you tell me about this last certification?*

I am a board certified veterinary clinical pathologist. What that means is I went to veterinary school, then I worked in general practice for four years. (This was really important to me to get to do that.) Then I went back and did a residency in clinical pathology and a PhD in pathology. Then I got my board certification as a veterinary clinical pathologist. What I've focused on in my work has been comparative pathology, those diseases that cross all species. In this role, the knowledge base [has allowed me to] look at all the things that dogs and people have in common. And if you ask me what my true love is, it's red blood cells.

*Why do you think you're drawn to red blood cells?*

Hematology [the study of blood and blood disorders] is part of clinical pathology. There are two arms of pathology, anatomic pathology and clinical pathology. Most people think of anatomic pathologists as the people doing the autopsies, which in animals we call necropsy. The clinical pathologist is the one who's looking at samples while the animal or person is still alive. So, blood samples, fine needle aspirates of tumor samples, skin samples, different things like that. When I was in practice, I thought I wanted to be an ophthalmologist when I got out of vet school. Then I went into practice and I realized where I needed to know more was in clinical pathology. I needed to know more about what those blood test results meant and what those cytology test results meant. I was driven to go learn more about that.

*That drive, is it born of curiosity?*

That's what my brothers tell me.

*Somebody once asked me to name my most treasured possession, and I said it was my curiosity. I enjoy learning new things.*

Yes, constant learning.

*The dog world can offer breeders plenty of opportunity for learning. Can you speak to the value of your work to breeders who are breeding to the standards and working to improve their dogs' overall health? Any encouraging words?*

Absolutely, because that's really my passion here. I'm driven to outcomes that are going to improve the health of all dogs, and the needs there vary greatly from the small breeds to the giant breeds. Sometimes [the need] is very breed specific, and sometimes it's for all dogs. Let's take, for example, the number one neurological disease across all dogs: epilepsy. We launched an epilepsy initiative because there's still such a great need to have better medications, better diagnoses and better genetic tests to diminish its prevalence and improve treatment for the quality of life for the dog as well as the owner. (If you've ever known anyone who has an epileptic dog, it's probably one of the most intensive labors of love.) So, that's an example that benefits all dogs. Then you get to the more breed-specific concerns. [Some] breeds might have a concern over a particular heart defect or a particular eye defect. For those we've been able to target research specifically in those breeds to look at those conditions to find a



Dr. Diane Brown welcomes guests to the 2019 AKC CHF Canines & Cocktails event in Orlando, Florida.

genetic test. Responsible, health-conscious breeders can do those genetic tests and find a way to minimize that genetic defect in their breed. There have been some really great examples of this. I'll use exercise-induced collapse. EIC was first recognized mostly in Labrador Retrievers, but it also affects other breeds. AKC CHF-funded research actually led to the discovery of the gene [responsible for the disorder]. Sometimes you can find a single gene for conditions, sometimes it's complex and multifactorial. But in this particular case, the EIC genetic test was developed and this condition has been significantly reduced in Retrievers.

*How are the funds raised for this type of research program?*

I like to look at everything that we do as a balance. So, we have a balanced research portfolio across breeds, across all dogs. We also take that approach to our fundraising. We have donors that know nothing about the AKC, that have never been involved with dog shows, but love their dogs. Sometimes those are purebred dogs they grew up with and sometimes they are mixed breed dogs that they now own. We've got these people who believe in what we do and believe in science driving good health. So, we have that constituency. Then we've got the 200 parent clubs of the AKC that also have different things they're concerned about. They will come to us looking to fund the best research to address the questions they have. Unfortunately, some of this leads to this perception out there in the world that purebred dogs are less healthy. I disagree with that. What I see instead is that the big investments in health often come from research for a particular breed. When those studies are then done to examine that condition in that breed, they get published in a scientific research journal. Veterinarians and others read these and think, "Oh, well. This is a problem of Golden Retrievers." No, it just happens to be that the Golden Retriever [people] funded this work through AKC CHF. They brought all the samples and participated in the research, and this is the outcome. We have to be careful that everyone understands that the investments and the passion from motivated breeders has pushed the science forward for all dogs.

*There's so much prejudice against purebred dogs today.*

There can be. But let's consider lymphoma. All dogs—including mixed breed dogs—get cancer, unfortunately.

*You've mentioned lymphoma. My sister's Rhodesian Ridgeback received treatment for this cancer from the University of Pennsylvania School of Veterinary Medicine. PennVet was working with Children's Hospital of Philadelphia to develop a vaccine that might one day be used to treat pediatric lymphoma. At the time, the vet school was waiting to launch a study using newly diagnosed dogs that had received no prior treatment. My sister, who is an RN and works at a cancer treatment center, was very motivated to participate in the study at her own expense.*

That's a really great example of how this works.

*Through this experience I learned about the One Health approach to medicine that recognizes the connection between the health of animals, people and our planet. Can you speak to this interconnectedness as it relates to infectious diseases?*

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Mari-Beth O'Neill and Dr. Diane Brown pose with a group of Theriogenology students.

The vision of the people who started the AKC CHF—really, the wisdom that went into the development of our mission statement—was for all dogs and their people. So, to include this 25 years ago has allowed us to grow that One Health aspect in what we do. We take findings and scientific breakthroughs from human medicine and apply them in research to help dogs. And things we learn in dogs are taken and applied to help humans. A lot of this ends up being pediatrics. It seems like things that help dogs can end up informing pediatric health as well. But, yes, we're all on one planet. We all share one environment. In most cases with our dogs, we're drinking the same water and eating some of the same foods. We're out on the same lawns and, sometimes, we're in the same bed. We are exposed to the same environmental toxins, vectors, vector-borne disease, tick-borne diseases, and all of that. And so, we've learned how things work in dogs and this helps to inform so broadly. I come from the world of comparative pathology, so when I was on faculty at Harvard Medical School we were doing the same thing from that angle. Everything that we learned had a comparative aspect that you could apply. Since dogs are so closely aligned with us in our environments, what we learn from them is especially meaningful as compared to a rodent that lives in a cage, for example. Right now, one of our big comparative projects is in the comparative brain tumor consortium. We're working with the National Institute of Health (NIH) on this project because brain tumors in people are difficult and brain tumors in dogs are difficult. They're difficult to study and they're difficult to treat. So this [research project] is bringing together all the resources of the NIH and the National Cancer Institute with us and what we can do to address brain tumors. That's going to be incredibly informative in the future.

*Is this a new study or a new partnership?*

Yes, it's been a partnership over the last couple of years and continues to evolve. We've moved through several tumor types and there are several more to go. It's encompassing so much different information from imaging to treatment and clinical trials, to getting genetic information and genomics for accurate diagnoses. Because—going back to our lymphoma example—lymphoma is no longer just lymphoma. If you have a diagnosis of lymphoma, it's incomplete. It [needs to be] broken down into these comparators that help us to learn so much more. What type of lymphoma? Is it a T-cell lymphoma? Is it a B-cell lymphoma? Why will some respond to treatment, but not others? We are finding that there are these differences within a particular tumor type. This is where the science becomes complex. I look at the scientific research as an investment we make for the future. Because we'll fund a study and it may be 3-5 years before that's completed and published, but it will help to inform what's next. There are very few things in science that happen quickly, so I look at it as an investment. And if you can think about it that way then you can see how much has been accomplished.

*On the AKC CHF website I found a quote that reads, "In science, progress is measured in small steps along the way to major discoveries." I think that most dedicated breeders take a similar approach to producing healthy dogs. Any thoughts on this?*

Very health conscious breeders are crucial to the investment in research. I mean, they know more about a breed than anybody. There is nothing like a motivated breeder. I see so many who are health conscious and dedicated to preserving, maintaining, and improving the health of their dogs as their primary goal. When we have breed clubs that will become involved in these studies (and you've got those breeders who care about health and science from all over the country sending samples, participating), that's how these investigators see that they can get to an outcome. Because, if they're struggling to recruit cases for a clinical trial, such as the lymphoma trial you had defined, that slows everything down.

*You've mentioned 'preserving' the health of dogs. Today's purebred dog breeder increasingly views him or herself as a preservationist. Would you say that veterinary pathologists are also preservationists?*

That's an interesting way to put it, but maybe the way I would say it is that we are providing more tools for the breeder to use and a genetic test is only one tool in your toolbox. (But if you didn't have that tool before, you were missing a potential piece.) With treatments, there's a lot that revolves around genetics, but it doesn't all revolve around genetics. Anyone who says, "You can solve a whole breed's problems through genetics..." Well again, genetics is one piece of that puzzle. It's one of those building blocks, one tool in the toolbox. And over-interpreting or overusing one single tool doesn't necessarily help to preserve a breed.

*Some breeders use a health test score as the primary tool when making breeding decisions. Isn't there more to selecting for overall health and longevity than a test score?*

Sometimes a genetic test doesn't have the whole answer for a complex disorder. Let's take degenerative myelopathy (DM), for example. There's a really excellent researcher working on that with steady progress. We have funded that work for years, but a genetic test is only one piece... and there's a lot that has to be properly

disseminated for education because it's complicated. I'm not a geneticist, but when you have these complex conditions that are not single gene mutations that lead to a specific defect, most of what we're up against now is probably polygenetic, multifactorial, epigenetics. (Other things in the environment, etc. that are influencing the development of this disease.) And all of those have to be taken into account. So, what you're saying is exactly right. You need to look at pedigrees, you need to look at where these different things might have been thrown, you need to look at the phenotype, you need to look at the genotype, all of it, the whole big piece of a bigger puzzle. I look at the top breeders who really focus on health that use that whole big picture.

*You've mentioned tick-borne diseases, which seem to me the most insidious. What types of research programs are currently underway in this area?*

In 2016, we launched our Tick-Borne Disease Initiative. What drove this is I was looking at our portfolio of research and felt like we were not addressing the bigger picture problem that performance dogs, field trial dogs, etc. were especially interested in. [Though these dogs] are probably more highly exposed, I made the argument that so is the Chihuahua who is out for a walk in the grass. We are seeing the spread of ticks and learning more and more about how ticks carry more than one disease that can be harmful—and if you're only testing for one disease you're missing the other one. We keep learning more about that. So when we launched that initiative, I was thrilled. Not only did the Field Trial people and the Sporting dog people come in and really get behind this, our first small breed donors to that initiative were the Shih Tzu [fanciers].

*Really? A little lap dog?*

They could see the value of this initiative as well. You know, ticks can be in your home and they can be in the grass. It fits into what I would call these emerging and reemerging infectious diseases that we're seeing. (The outbreak of influenza in dogs, the first one which in 2015 was tied back to importation of dogs from Korea.) This global transport of dogs without proper regulation is really adding to the challenge of these infectious diseases that we're seeing on the rise. We are now seeing more heartworm disease because dogs are transported around. We're also seeing more tick-borne diseases because the climate is changing. We only used to think of Lyme Disease being in the Northeast, now it goes all the



The impact that AKC CHF has had toward advancing the health of all dogs can be measured in any number of ways.

way across the top of the country. The Gulf Coast tick and the diseases that it carries used to be isolated, now it's coming up this [Eastern] side of the country. We are so closely connected that those diseases are on the rise in people just as they are in dogs.

*That really speaks to the One Health approach, doesn't it? I really appreciate that you brought up this movement of dogs from other countries. So much of the mindset among the general public is that lives are being saved. But what about the diseases that come with those dogs?*

Yep, and public health concerns. Three months ago, dogs rescued from Egypt ended up in the U.S. where they were placed from a shelter into homes. Three of the dogs had rabies. Rabies is a uniformly fatal disease that is zoonotic—people and dogs can get it—and that's terrifying. If people are not terrified by that...

*A few years ago, I replied to a social media post in defense of dogs being brought into the U.K. from Eastern Europe with one word: rabies.*

One word. Then you can start going down the list: distemper; leishmaniasis; drug-resistant heartworm; parvo; brucellosis. That [2015] influenza? That was a new strain when it came. So, this needs to be important to all of us from a standpoint of health. Everybody's going to think about it when it's a public health crisis.

*That's preventable, or at least...*

Monitorable, regulatable, if that's a word, and yes, preventable.

*When responsible purebred dog breeders speak with people who support "rescue dogs" for emotional reasons, we need to have an opposing position that's based in science and speaks to the risk of unregulated importations.*

It is a risk. That is a whole picture that needs to be addressed, because we are already seeing some alarming diseases with those trends. And this brings us full circle back to look at the breeders who should not be so maligned for breeding healthy, purpose-bred dogs. That's, I think, where we have to focus and understand that the people who are so dedicated to this level of quality are really being responsible. I think that sometimes they are not recognized. But I have the good fortune to be able to interact with a lot of those people who've dedicated their lives to healthy dogs. When I was in practice as a veterinarian, I had breeders in my practice and they were great clients. Were they knowledgeable? Yes. Were they demanding? Yes. Was it good that they were demanding? Yes.

*How can the relationship between purebred dog breeders and their veterinarians be improved?*

Part of what we do here [at AKC CHF] is to try to bring breeders and veterinarians together so that they can help one another. We are an independent affiliate of the AKC, so we are a 501(c)(3) non-profit organization. We have our own staff and manage our own finances, and we work very closely with the AKC which has a veterinary outreach program. They [AKC] get into the veterinary schools and meet with the students and have them talk to breeders and learn more about this. We've been able to partner with AKC so that every veterinary school that they go to, they can take along information [that features] the research we're funding at their organization and the faculty doing the research to better the health of dogs. That really is a touchpoint for those students and those schools. I really commend AKC for what they've done. Veterinary students need to know that side of the story. They need to know what [the AKC] does and they need to know what our foundation does. We can educate students who take that [knowledge] forward with them as they go through school, with their faculty, and then once they're out in practice. There's also a business argument to be made for having some of your best clients be breeders that want to work with you.

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Left to right: AKC CHF Board members Dr. Kristin Bloink and Dr. Diane Brown share a moment with a friend at the Golden Retriever National Specialty. Smiling vet students at the AKC CHF booth at Westminster encourage breeders and exhibitors to become members.

*That last point is really important. Don't breeders and vet students share a common love of animals?*

I think that people still go into veterinary medicine because of the passion and the heart that goes with caring about animals. But you can only be as good as what you're taught. So [it's important to] get into the schools, fund educational grants and work with the AKC. It's also important to bring students to dog shows so they see what that's like, what's involved. I use the example of the racing Pugs. When veterinary students see Pugs doing agility, for example, they say, "I didn't know Pugs could race!" You know, it's the nature of the work that veterinarians usually see animals that are sick. But when they come to a dog show they find all these healthy dogs!

*What else is the AKC CHF doing to help foster good will among vet students and pure-bred dog breeders?*

We fund clinical scientist fellowships, because who's going to train the next generation of veterinarians and scientists for animal health? We collaborate with the AKC and the Theriogenology Foundation for the theriogenology residency grant program. Theriogenology is the study of reproduction in animals across all species. What we've tried to do with this program is bring funding into the veterinary schools where they can train post-DVM residents to actually be working with dogs. And in every case we have seen the caseloads at those schools grow through bringing in this small animal theriogenology residency funding. Those residents then are working with breeders.

(Local breeders get involved, we encourage that.) This has been another way to have veterinary students and faculty be able to see what breeders are trying to do and understand what they're trying to achieve. They're working with canine reproduction, female and male, semen evaluation, TCI, the whole bit. (This is an area in veterinary medicine where programs were going away, and the Theriogenology Foundation and the AKC recognized that.) Then they're also teaching veterinary students. There's something about veterinary students learning from their own peers and colleagues, right? We at AKC CHF became involved to manage the whole grant process and, again, we're seeing fantastic outcomes. The veterinarians graduating from these programs are now out in practice working with breeders and they're specialists in reproduction.

*Is it a two-year residency?*

Some schools do a two-year residency, others do a three. We now have a competitive grant program going forward where we're able to fund two new residents a year at different schools. They've finished their veterinary degree and are being spread across the country. They've got significant student loans, so if they're not provided funding to go and train at that next level, they end up going into practice because they need a job. The [residency] grants are \$100,000 so students can be paid a living wage while they're training in their residency. They then need to go pass their boards. So, they study, they write articles for publications and they pass their board exams. Then they're specialists out in practice, serving breeders. It's adding to that critical mass that breeders really need for support. But, let's say you're training at a veterinary school and you don't have a small animal theriogenology program there. You probably will never see a pregnant bitch, a litter of puppies, do a C-section, etc. [By contrast], the theriogenology grant program has been successful with the AKC getting into the vet schools and bringing local breeders who come and take the vet students to dog shows and/or bring in their pregnant bitches and their puppies so that the students can see how this works. And I've even heard of instances where breeders around veterinary schools will invite veterinary students to come when they're going to be whelping a litter. Bringing the therio residency program into a school helps make that official. Mari-Beth O'Neill is the person in charge of veterinary outreach at AKC. One example, she and I both went to a week-long dog breeding elective course that North Carolina State University held, and vet students elected to attend. It was run by a theriogenologist faculty member and the theriogenology resident whom we were funding. They arranged with all these local breeders so that every day they had different breeders in and all these students could be hands-on. They got to look at pregnant bitches. They got to learn how to collect a male. They got to learn how to look at semen samples. They got to learn how AI works. They learned about—as Mari-Beth fondly says—pupsicles. They made those connections and you could see their eyes lit up. It's such a two-way street to have the breeders participate.

*It's reassuring to learn that those students might have a deeper understanding of a breeder's motivation for planning, producing, raising and placing a litter of purebred puppies. Maybe we should all consider extending an invitation to our vet's office to come over for a visit?*

Yes, come and look at the list of the things that you've tested. Look at the pedigree records you've kept. Look at all you've done [for your dogs], how they're housed and how they're cared for. Frankly, breeders are going to be some of your best clients. I go back to that, and I think that we all want an endpoint of healthy dogs. But how do we get there? It takes everyone participating together, and you can't blockade any particular thing with a negative stereotype and expect to have a meaningful outcome. From the standpoint of health, I think we're starting to see some movement away from this blanket message that breeders are bad, only spay and neuter. We now have data. These investments in health research have led to publications and outcomes for data [that determine] what's going to be best for the health of your dog.

*And what benefits my dog will also benefit your dog?*

At the end of the day, a dog is a dog. From my seat, the AKC CHF is for the health of all dogs. We work on behalf of all dogs, and what we learn from all those dogs helps other dogs. What we've learned from a Rhodesian Ridgeback will help a Chihuahua, and it will probably help humans as well.

*The AKC CHF also works closely with the Orthopedic Foundation for Animals (OFA). How is this partnership beneficial to the health of all dogs?*

We have a very strong relationship with the OFA that's been growing over the years. They have grown so much beyond just being about orthopedics, you know, through the Canine Eye Registration Foundation (CERF) eye exams and the cardiac exams. They are a real advocate for dog health, [particularly] with what they do with the Canine Health Information Center (CHIC) program. We helped to develop the program with them and we support one another. CHIC has, I think, been critical as a place for dog breeders to go and for dog owners to go. I encourage all breeds to participate in the CHIC program because we have been able to advance the most health research for participating breeds. When breeders are willing to share samples—and when they're banked at CHIC—they're then accessible to our funded researchers. They're not sitting in someone else's freezer that you can't access. (I have heard too many bad stories about samples lost over the years at different university freezers.) So the OFA is really behind good health for dogs and is a good partner. I really strongly encourage all [breed clubs] to partner with them.

*Twenty-five years is quite a milestone. Can you imagine what the next 25 years will hold? Where would you like veterinary medicine to be when the AKC CHF turns 50?*

That's a really good question and a powerful question. When I look at where veterinary medicine has come in 25 years, with the onset and growth in genetics and genomics technologies, we're just now starting to see where that's going to be applied for outcomes down the road. So, I think in another 25 years we will have eradicated a number of these types of cancers (or learned how to prevent them or how to treat them better). We will have improved immediate diagnoses so that we know, we're not guessing. Does this dog (or human) have Lyme disease? Is the Lyme disease causing the disease in this dog? Did we miss that it also had Babesia? That'll be long past because we'll have these very defined pathogen tests that are going to give us the whole spectrum of information. There's going to be this information explosion and part of what's going to have to

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come with that is how to manage the bioinformatics. How do we manage that big data and distill it down into what is meaningful in the outcome? So there's going to be a lot of work now that's going to go with machine learning and artificial intelligence and that sort of big data modeling. That's really going to blow wide open what we've known about disease prevalence in dogs.

*That's really exciting. How can we encourage our readers to support your programs and get the parent clubs to which they belong to support funding for research?*

I would say there is something at the AKC Canine Health Foundation for everybody. If you want to be breed-specific in a condition that you care about in your breed, you can be as specific as that in your support. Or you can be one of those people who sees that we've got to tackle tick-borne diseases in dogs and you go in that direction. No longer can anybody say, "Well, they're not doing anything for my breed, or their not doing anything for my dog." That's not true anymore. Our portfolio and our programs have grown so much. [The AKC CHF 2020 Research Grants Portfolio includes research in 24 separate program areas, including Blood Disorders, Dermatology and Allergic Disease, Endocrinology, Immunology and Infectious Disease, Musculoskeletal Conditions and Diseases, Oncology and Ophthalmology.] It takes all of us investing in this to be able to get the critical mass we need to move science forward in a big way. These clinical trials in epilepsy, in lymphoma, in hemangiosarcoma that we're funding with our donors, they take big resources to be able to support the research and the people who participate. For example, you talked about your sister who participated [in a lymphoma study] at her own expense. We're trying to fund clinical trials where people can participate and help get the cost offset to move forward. Those investments then are key to how we're going to get real scientific data that will be measurable and have a meaningful outcome. Because, as I've said, the days of guessing at a diagnosis or a type of cancer are gone. We have to be specific. All of us working together, moving forward together for healthy dogs means a brighter future for all dogs and their people.

*Anyone who cares about the health and well-being of dogs can support the AKC CHF (a highest 4-Star rated charity with Charity Navigator) in any number of ways, including through Memberships, Monthly Giving, and the Purina Parent Club Partnership Program. Please visit [akcchf.org](http://akcchf.org) to learn more. ■*