

Cultivating research on cancer in dogs, from clinical trials down to the molecular level

By Katie Burns
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Dr. Amy LeBlanc, a veterinarian who is the second and current director of the Comparative Oncology Program at the National Institutes of Health, said, “Dogs provide us our very, very best representation of human cancer aside from humans themselves, and that’s because they develop cancer naturally just as a part of their life on this planet.”

Dogs eat a lot of human food, sleep in their owners’ beds, walk on the same lawns, and breathe the same air. Dr. LeBlanc said: “They’re not laboratory animals that are kept in very contrived, controlled environments that have experimentally induced disease. This is as real as it can get.”

She said dogs also have intact, functional, educated immune systems because they are vaccinated and they get sick occasionally.



Dr. Amy LeBlanc treats a cancer patient named Roxy enrolled in a trial sponsored by the Comparative Oncology Program at the National Institutes of Health. Dr. LeBlanc was then on the faculty at the University of Tennessee and is now director of the program at the NIH. (Courtesy of Dr. LeBlanc)

Dr. LeBlanc described the Comparative Oncology Program at the NIH as a platform for uniting researchers across veterinary academic centers. The program’s Comparative Oncology Trials Consortium currently has 21 members in the United States and two in Canada. Since its inception in 2003, the consortium has completed 17 clinical trials with 738 dogs.

Cancer in dogs looks like cancer in humans even at the molecular level, Dr. LeBlanc said, and the program recently has focused more on the biology of cancer in dogs, assisted by an explosion of tools such as improved annotation of the canine genome and tools to interrogate gene expression in canine cancer.

As the Comparative Oncology Program becomes integrated with the broader field of oncology, another change is that the NIH is directly funding some canine cancer research, in areas such as immunotherapy and genomic characterization. The latest development is that the NIH funded the creation of the [Integrated Canine Data Commons](#), a repository for canine cancer data.

Dr. LeBlanc said the Comparative Oncology Program itself has created a large-scale genomic characterization project for osteosarcoma in dogs. Osteosarcoma is relatively common in dogs but is a rare disease in humans that mostly affects teenagers and young adults, so pediatric oncologists have a strong interest in dogs as models.

The Comparative Oncology Program also worked with the Morris Animal Foundation on a trial evaluating a vaccine for osteosarcoma in dogs, led by [Dr. Nicola J. Mason](#), a professor at the University of Pennsylvania School of Veterinary Medicine. The same vaccine platform is now being used in clinical trials in children. This harmonization between veterinary and human oncology is a major accomplishment for the program, Dr. LeBlanc said.

An NIH-funded study, [published in Molecular Cancer Therapeutics in October 2022](#), found that a new drug for multiple myeloma is tolerable and effective in dogs. Multiple myeloma is rare in dogs and humans, Dr. LeBlanc said, but the current treatments in humans are sometimes not well tolerated. The trial in dogs opened the door to a trial in humans.

Mouse modeling work continues behind the scenes, too. Dr. LeBlanc said mice are important because they offer a method for prioritizing ideas, providing a step from studies in cells on the way to studies in dogs and humans.