

Trial Launched to Test CAR-T Therapy in Dogs Diagnosed With Solid Tumors

The novel treatment is successful for blood cancers, but results in patients with solid tumors, including bone, brain and prostate cancer, have not been nearly as impressive.

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Dogs are like humans in many ways, sharing similar physiology as well as biological needs. Our four-legged friends are also vulnerable to some of the same diseases that we face, making the intersection of human and animal medicine an intriguing subject for study.

One new area of exploration is the use of chimeric antigen receptor (CAR) T-cell therapy, which utilizes the body's immune system and modified white blood cells to fight cancer. The novel therapy has proven to be successful in treating tumors that develop in the blood, bone marrow, or lymph nodes, including leukemia and lymphoma. In human studies, about [half of patients](#) with these cancers who do not respond to chemotherapy and stem cell transplants enter remission after receiving the treatment.

[Gates Institute](#) member Steven Dow, DVM, PhD, a veterinary internist and cancer researcher at the [Flint Animal Cancer Center](#) at Colorado State University and [University of Colorado Cancer Center](#) member, said what excites clinicians – including veterinarians -- about the therapy is that it's a living drug.

“These are cells that can potentially live in your body for months or even years,” he said. “The cells eradicate the cancerous tumor with the aim to make sure it doesn't recur.”

But Dow said the results in patients with solid tumors, including bone, brain and prostate cancers, have not been nearly as impressive. That's why he and his team at CSU recently kicked off a new CAR T-cell trial for [pet dogs with metastatic osteosarcoma](#).

The trial, a first for CSU, will investigate the use of different doses of CAR T-cell therapy, with a goal of enrolling nine dogs in three different groups, said Kristen Weishaar, DVM, clinical trials director at the Flint Animal Cancer Center.

Dow is collaborating with Gates Institute Translational Sciences Lead [Michael Verneris, MD](#), a professor of pediatrics, hematology, and oncology and CAR T-cell expert at the [University of Colorado School of Medicine](#). He also holds leadership positions at the [University of Colorado](#)

Collaborating to Fight Cancer

Shortly after moving to Colorado in late 2016, Verneris' Bernese Mountain dog Sadie developed osteosarcoma. She had an amputation, received chemotherapy and relapsed. When he learned about CSU's clinical trials and expertise in treating companion animal cancers, he enrolled Sadie in a study led by Dow and Dan Regan, DVM, PhD.

Around that same time, Verneris and Dow met at a cancer seminar and began discussing their current research into osteosarcoma, which occurs in both dogs and children.

The collaboration came about quite naturally, according to both clinicians.

"I knew Mike was working with CAR T cells, and I started to consider the opportunity we might have to collaborate," said Dow.

They secured funding from the [V Foundation for Cancer Research](#) to support the new clinical trial.

Targeting Solid Tumors

In humans, osteosarcoma is the most common bone tumor in adolescents and young adults. Pediatric and young adult patients with metastatic osteosarcoma at diagnosis or who relapse after initial treatment have a poor prognosis, with only a 30% survival at most at five years.

Verneris said there's been very little progress in the field for years.

Dow said the new clinical trial is a first step.

"We will target bone cancer, other sarcomas and potentially brain cancer in trials with dogs diagnosed with cancer, paving the way for human clinical trials," he said.

Dogs are like humans in many ways, including how their immune systems recognize and respond to malignant tumors.

"Dogs are vaccinated like humans are, they have infections, and their tumors tend to develop slowly," said Dow. "When their tumor develops, their immune systems have become 'educated' to the presence of the tumor, much like the case in humans with cancer. That's in part why treating dogs can help advance CAR T-cell therapy for pediatric cancers."

The veterinary researcher said that pet owners should understand it's too early in the CAR T-cell research process to predict success.

"We want people to understand how important collaborative research like this is, investigating

new and better ways to treat cancer using innovative models,” he said. “The research can benefit pets as well as people.”

Dow is no stranger to collaborating with Gates Institute and CU Anschutz clinicians and researchers.

In 2014, he presented results on an innovative cell therapy used to treat chronic resistant infections to Dennis Roop, PhD, then director of Gates Center for Regenerative Medicine (Roop is now associate director of the institute). This led to Dow landing one of the original [Gates Grubstake Fund](#) awards to support [his research](#) in this area.

He also presented new insights into childhood cancer gained from clinical trials to treat canine cancers with [Terry Fry, MD](#), in 2018 at a [national meeting](#) on regenerative medicine. (Fry is now executive director of the Gates Institute.)

Dow said that his collaborations forged through Gates Institute have been rewarding.

“It’s fantastic to work with physicians who are open to the concept that pet dogs and even cats can play an important role in their work and research to improve care for adults, adolescents and pediatric patients,” he said.

Learn more about the [new clinical trial](#) on the Flint Animal Cancer Center’s site.

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