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Man's Best Friend

Canine Melanoma Research May Translate to Humans

From Lassie to Rin Tin Tin, stories abound about dogs that heroically save their masters' lives by braving icy waters or running for miles to find help. But with research currently being conducted at the [University of Missouri College of Veterinary Medicine](#), new stories are being written about dogs that save lives in a slightly more scientific way.

Carolyn Henry, DVM and assistant professor at the College, heads a project designed to measure the effectiveness of a melanoma vaccine on dogs who have been diagnosed with oral cancer. If the vaccine proves to be successful, this research may have a profound effect on the ability to control and eliminate melanoma in humans, too.

Melanoma, a particularly dangerous type of skin cancer, is the fastest growing form of cancer in the United States. It affects men, women, and dogs, and when left untreated, malignant melanoma can spread to other organs with fatal consequences. Current treatments include surgery, radiation, and chemotherapy.

Although vaccines have been used to prevent diseases for nearly a hundred years, treating melanoma and other cancers by vaccine is a relatively untapped concept being tested in clinical trials. Dr. Henry's research, one of only a handful of trials in the nation involving dogs, is among the most promising.

Dr. Henry's project began in February 1999 with the aid of Jim Schwarz, MD, an oncology fellow at MU's Ellis Fischel Cancer Center, and Drs. Mary Lynn Higginbotham and Dudley McCaw, oncology residents at MU's Veterinary Medical Teaching Hospital.

The team's plan was to create vaccines using malignant cells taken from companion pets with melanoma. Once those cells were removed from the affected dogs, they were to be irradiated and combined with a viral vector to form a tumor cell vaccine in which the cells would produce GM-CSF, a substance that can activate the patient's immune system and induce natural killer immune cells. The vaccine was then to be reintroduced into the dogs' systems by injection, ideally fighting the malignant melanoma cells through this immune system activation.

Early tests suggested that, although this approach may be effective, the creation of individualized vaccines could become problematic in terms of both time and money. So, a more manageable method was adopted.

Instead of making custom vaccines for each dog, the new approach involved the creation of a single vaccine from the malignant melanoma cells of two different dog breeds with cancer. This new vaccine, technically described as an allogeneic vaccine, would then be used to treat all of the other dogs involved in the clinical trial.



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This change provided several benefits for researchers. First, more dogs could be included in the program, and investigators also could test a single vaccine in animals with varying degrees of melanoma occurrence.

To date, approximately 25 dogs have undergone the eight-week vaccine process. No significant negative side effects have been documented, and improvement has been noted in some of the participating pets. "It is important to point out that the dogs involved in this study are all companion animals," Dr. Henry says. "They live at home and are brought in by their owners for weekly vaccinations. Their cancers appeared spontaneously in a real-world environment, just like people get cancer in everyday life."

According to Dr. Henry, the fact that oral melanoma in dogs closely resembles cutaneous melanoma in humans makes her study compatible with research currently being conducted at Ellis Fischel. In essence, the research on dogs may serve as a useful precursor to related studies involving human patients.

"This type of study can be implemented in a time frame substantially shorter than similar studies in on human patients," Dr. Henry says. "And, during that period of time, we can work out specifics of a testing, such as dosage, methods of measurement, and possible negative side effects. This type of research has the potential to affect a variety of human melanoma vaccine studies being conducted around the country."

Some of these studies are being directed by Clay Anderson, MD, an assistant professor of hematology and oncology at Ellis Fischel. Although there is no direct link at this time between the results of the MU veterinary studies and Dr. Anderson's human research, he is keenly aware of Dr. Henry's work.

"Right now, faculty and staff members of the College of Veterinary Medicine, the School of Medicine, the Research Reactor Center, Ellis Fischel, and other parts of the MU campus share research dollars and ideas and function as a sort of 'virtual' cancer center," Dr. Anderson said.

"Given the direction that our current efforts are headed, it is very realistic to expect that we could take a project from test tube to animal research to human testing and on to a final licensed product all on this campus in the very near future. This multi-pronged approach makes research more effective and less toxic to humans. And, when we help dogs along the way, that's the real benefit."

The mutually beneficial nature of such translational [veterinary research](#) may be illustrated best by the story of Murphy, a cairn terrier with skin cancer treated by Dr. Henry. Murphy had been referred to Dr. Henry by a veterinarian in Missouri after a malignancy was diagnosed. During that same period of time, Murphy's owner also was diagnosed with cancer and had just begun chemotherapy.

"It was an unusual relationship that existed between those two," Dr. Henry recalls. "Somehow the hopefulness of the treatment we were providing to Murphy gave his owner an added dimension of confidence in his own fight against cancer. And, undoubtedly, the extra care shown to Murphy by his obviously empathetic owner helped the dog throughout the course of therapy.

"I don't know exactly where our current research will lead in terms of human cancer treatment," Dr. Henry adds. "But, I can tell you that on those days when those two came in together, a positive report on that little dog had a direct and profound effect on his human friend."



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Visit the [Morris Animal Foundation \(MAF\)](#), which launched the CCC's effort to cure canine cancer.

Click here for more information on which [dogs breeds are susceptible to cancer](#).