

## Compound Derived From a Mushroom Lengthens Survival Time in Dogs With Cancer, Penn Vet Study Finds

**P**HILADELPHIA — Dogs with hemangiosarcoma that were treated with a compound derived from the *Coriolus versicolor* mushroom had the longest survival times ever reported for dogs with the disease. These promising findings offer hope that the compound may one day offer cancer patients — human and canine alike — a viable alternative or complementary treatment to traditional chemotherapies.

The study was conducted by two [University of Pennsylvania School of Veterinary Medicine](http://www.vet.upenn.edu/) (<http://www.vet.upenn.edu/>) faculty. [Dorothy Cimino Brown](http://www.vet.upenn.edu/FacultyandDepartments/Faculty/tabid/362/Default.aspx?faculty_id=2312829) ([http://www.vet.upenn.edu/FacultyandDepartments/Faculty/tabid/362/Default.aspx?faculty\\_id=2312829](http://www.vet.upenn.edu/FacultyandDepartments/Faculty/tabid/362/Default.aspx?faculty_id=2312829)) is professor and chair of the [Department of Clinical Studies](http://www.vet.upenn.edu/FacultyandDepartments/ClinicalStudiesPhiladelphia/tabid/360/Default.aspx) (<http://www.vet.upenn.edu/FacultyandDepartments/ClinicalStudiesPhiladelphia/tabid/360/Default.aspx>) and director of the [Veterinary Clinical Investigation Center](http://research.vet.upenn.edu/Default.aspx?alias=research.vet.upenn.edu/vcic) (<http://research.vet.upenn.edu/Default.aspx?alias=research.vet.upenn.edu/vcic>). [Jennifer Reetz](http://www.vet.upenn.edu/RyanHospital/SpecialtyCareServices/Radiology/FacultyStaff/tabid/742/Default.aspx) (<http://www.vet.upenn.edu/RyanHospital/SpecialtyCareServices/Radiology/FacultyStaff/tabid/742/Default.aspx>) is an attending radiologist in the [Department of Clinical Studies](http://www.vet.upenn.edu/FacultyandDepartments/ClinicalStudiesPhiladelphia/tabid/360/Default.aspx) (<http://www.vet.upenn.edu/FacultyandDepartments/ClinicalStudiesPhiladelphia/tabid/360/Default.aspx>). They published their findings in an open-access article in the journal [Evidence-Based Complementary and Alternative Medicine](http://www.hindawi.com/journals/ecam/2012/384301/) (<http://www.hindawi.com/journals/ecam/2012/384301/>).

The *Coriolus versicolor* mushroom, known commonly as the Yunzhi mushroom, has been used in traditional Chinese medicine for more than 2,000 years. The compound in the mushroom that is believed to have immune-boosting properties is polysaccharopeptide, or PSP. In the last two decades, some studies have suggested that PSP also has a tumor-fighting effect.

“There have been a series of studies looking at groups of people with cancer,” Cimino Brown said. “The issue with those studies is that they weren’t necessarily measuring what most people would think is the most clinically important result, which is, do people taking PSP live longer?”

To address this critical question, Cimino Brown and Reetz pursued a study in dogs with naturally occurring hemangiosarcoma, an aggressive, invasive cancer that arises from the blood cells and typically affects the spleen. It commonly strikes golden retrievers and German shepherds.

Fifteen dogs that had been diagnosed with hemangiosarcoma participated in the trial. Divided into three groups of five, each group received a different dose — 25, 50 or 100 mg/kg/day — of [I’m-Yunity](http://www.imyunity.com/) (<http://www.imyunity.com/>), a formulation of PSP that has been tested for consistency and good manufacturing processes.

The owners were instructed to give their dog capsules of I'm-Yunity, compounded by Penn pharmacists, daily. Each month, the owners brought their dogs to Penn's [Ryan Veterinary Hospital](http://www.vet.upenn.edu/Default.aspx?alias=www.vet.upenn.edu/ryanveterinaryhospital) (<http://www.vet.upenn.edu/Default.aspx?alias=www.vet.upenn.edu/ryanveterinaryhospital>) for follow-up visits. There, the researchers took blood samples and conducted ultrasounds to determine the extent that tumors developed or grew and spread in the dogs' bodies.

Based on the ultimate endpoints — how quickly the tumors progressed and how long the dogs actually lived — the results of the researchers' trial suggest that the I'm-Yunity was effectively fighting the tumors.

“We were shocked,” Cimino Brown said. “Prior to this, the longest reported median survival time of dogs with hemangiosarcoma of the spleen that underwent no further treatment was 86 days. We had dogs that lived beyond a year with nothing other than this mushroom as treatment.”

There were not statistically significant differences in survival between the three dosage groups, though the median survival time was highest in the 100 mg group, at 199 days, eclipsing the previously reported median survival time.

The results were so surprising, in fact, that the researchers asked Penn Vet pathologists to recheck the dogs' tissue biopsies to make sure that the dogs really had the disease.

“They reread the samples and said, yes, it's really hemangiosarcoma,” Cimino Brown said.

Chemotherapy is available for treating hemangiosarcoma, but many owners opt not to pursue that treatment once their dog is diagnosed.

“It doesn't hugely increase survival, it's expensive and it means a lot of back and forth to the vet for the dog,” Cimino Brown said. “So you have to figure in quality of life.”

While I'm-Yunity is not inexpensive, if proven effective, it would offer owners a way of extending their pet's life without regular trips to the vet. As an added benefit, Cimino Brown and Reetz have found no evidence of adverse effects from the PSP treatment.

The researchers are now getting ready to pursue further trials of I'm-Yunity in dogs with hemangiosarcoma to confirm and refine their results. One trial will compare I'm-Yunity to a placebo for those owners who opt not to pursue chemotherapy in their pet and another will compare the compound to standard-of-care chemotherapy.

Depending on those results, veterinarians could eventually prescribe the compound for treating hemangiosarcoma, and perhaps other cancers, in dogs. The company that manufactures I'm-Yunity may also pursue large-scale clinical trials in humans.

“Although hemangiosarcoma is a very sad and devastating disease,” Cimino Brown said, “in the long term, if we prove that this works, this treatment can be a really nice alternative for owners to have increased quality time with their pet at the end of its life.”

The study was funded by a grant from Chinese Medicine Holdings LTD.

Pet owners and veterinarians interested in finding out more about this research and ongoing clinical trials may contact Penn's Veterinary Clinical Investigation Center at [vcic@vet.upenn.edu](mailto:vcic@vet.upenn.edu) (<mailto:vcic@vet.upenn.edu>) or 215-573-0302.

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