

Study finds spice slows growth of cancer cells

Compound in turmeric could be used to fight prostate cancer

By Roger Snodgrass
For The New Mexican

In the future, physicians may use a synthetic version of a compound found in turmeric to slow or block the growth of prostate cancer cells. Turmeric is an orange-powdered spice that flavors curry. Widely used as an anti-inflammatory and antioxidant, it is also used as a natural remedy for skin disease and senility.

In a broad collaboration, researchers at The University of New Mexico National Cancer Center have been studying the effects of a molecule based on the compound curcumin, the active ingredient in turmeric. They were surprised to see how quickly the version they called ca27 knocked out its target. After introducing ca27 into a Petri dish containing human prostate cancer cells, the principal investigators, Marco Bisoffi and Todd Thompson, noted the androgen receptors they were trying to control disappeared within an hour and a half.

"Wow, we've never seen this before," Bisoffi said, recalling the discovery. "It usually takes time."

Androgen receptors are the biological components of a cell that work with androgen hormones, compounds like testosterone that help regulate male characteristics and have an important role in the growth and progression of prostate cancer. Curcumin is known to inhibit the functions of the androgen receptor proteins, but it is hard to get enough of it in its natural form for the body to absorb. Ca27 worked quickly and also worked in concentrations that animals can tolerate.



Marco Bisoffi



Alexandra Fajardo

Spice: 30,000 men die each year from prostate cancer

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"There are problems with drugs that you have to administer a lot," Bisoffi said. "Ca27 works effectively at low concentrations."

Reducing the androgen levels is a key strategy for fast-growing prostate cancers, but some patients develop cancers with a resistance to the therapy.

Alexandra Fajardo was the primary contributor to the project and did the research that helped identify likely candidate compounds. She performed the experiments and generated the data.

"Once we identified ca27 as an inhibitor for androgen receptors, we wanted to figure out how it works," Fajardo said. "We did a lot of studies to figure out how ca27 was down-regulating the androgen receptor."

To understand how the agent not only reduced the cell's receptivity to androgen hormones but also killed some of them, the project made another

discovery they believe is exciting. They found evidence that the effect has to do with oxidative stress, that is, exposure to molecules containing highly reactive oxygen.

"Ca27 gets rid of the androgen receptors altogether by down-regulating their expression," Bisoffi said. "It might be a leading avenue into a new way of attacking prostate cancer." Treatments that might grow out of this new approach might be useful both early and late stages of the disease.

"It could address early-phase prevention, but it might be more feasible at later stages when the androgen receptors become resistant to other treatments."

Fajardo will receive her Ph.D. from UNM within a few days. Bisoffi is an assistant professor in biochemistry and molecular biology, and Todd Thompson is an associate professor at the College of Pharmacy. The research team with seven co-authors published a paper on the project in *The Prostate*

journal in July.

The university holds the patent for the approach and the molecule. Future work would include further investigation leading to animal tests, such as treating mice with ca27 in comparison with curcumin treatments.

Prostate cancer is the most common form of cancer in men and the second leading cause of death after lung cancer, according to the National Cancer Institute.

The American Cancer Society records an average of 1,312 new cases of prostate cancer in New Mexico each year, and nearly a quarter million nationally. More than 30,000 men die each year from the disease, including nearly 200 from this state. Costs for prostate cancer treatments are high and growing higher. More than 2 million living Americans have or have been diagnosed with prostate cancer. Those who are diagnosed early have a good chance to survive for more than five years.