Peaches, plums induce deliciously promising death of breast cancer cells

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Breast cancer cells -- even the most aggressive type -- died after treatments with peach and plum extracts in lab tests at Texas AgriLife Research. Credit: (Photo courtesy of U.S. Department of Agriculture-Agriculture Research Service)

Breast cancer cells - even the most aggressive type - died after treatments with peach and plum extracts in lab tests at Texas AgriLife Research recently, and scientists say the results are deliciously promising. Not only did the cancerous cells keel over, but the normal cells were not harmed in the process.

AgriLife Research scientists say two phenolic compounds are responsible for the cancer cell deaths in the study, which was published in the *Journal of Agriculture and Food Chemistry*. The phenols are organic compounds that occur in fruits. They are slightly acidic and may be associated with traits such as aroma, taste or color.

"It was a differential effect which is what you're looking for because in current cancer treatment with chemotherapy, the substance kills all cells, so it is really tough on the body," said Dr. David Byrne, AgriLife Research plant breeder who studies stone fruit. "Here, there is a five-fold difference in the toxic intensity. You can put it at a level where it will kill the cancer cells - the very aggressive ones - and not the normal ones."

Byrne and Dr. Luis Cisneros-Zevallos originally studied the antioxidants and phytonutrients in plums and found them to match or exceed the blueberry which had been considered superior to other fruits in those categories.

"The following step was to choose some of these high antioxidant commercial varieties and study their anticancer properties," Cisneros-Zevallos said. "And we chose breast cancer as the target because it's one of the cancers with highest incidence among women. So it is of big concern."

According to the National Cancer Institute, there were 192,370 new cases of breast cancer in females and 1,910 cases in males in 2009. That year, 40,170 women and 440 men died from breast cancer. The World Health Organization reports that breast cancer accounts for 16 percent of the cancer deaths of women globally.

Cisneros-Zevallos, an AgriLife Research food scientist, said the team compared normal cells to two types of breast cancer, including the most

aggressive type. The cells were treated with an extract from two commercial varieties, the "Rich Lady" peach and the "Black Splendor" plum.

"These extracts killed the cancer cells but not the normal cells," Cisneros-Zevallos said.

A closer look at the extracts determined that two specific phenolic acid components - chlorogenic and neochlorogenic - were responsible for killing the cancer cells while not affecting the normal cells, Cisneros-Zevallos said.

The two compounds are very common in fruits, the researchers said, but the stone fruits such as plums and peaches have especially high levels.

"So this is very, very attractive from the point of view of being an alternative to typical chemotherapy which kills normal cells along with cancerous ones," Byrne added.

The team said laboratory tests also confirmed that the compounds prevented cancer from growing in animals given the compounds.

Byrne plans to examine more fully the lines of the varieties that were tested to see how these compounds might be incorporated into his research of breeding plums and peaches. Cisneros-Zevallos will continue testing these extracts and compounds in different types of cancer and conduct further studies of the molecular mechanisms involved.

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