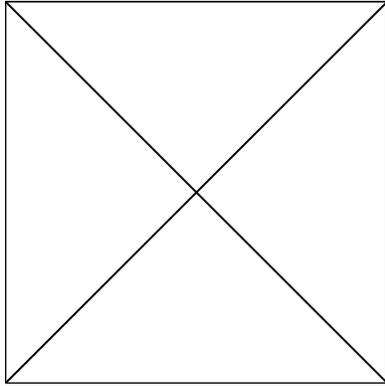


## UCR study: Eating fruits, vegetables boosts ability to fight cancer



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By LAURIE LUCAS  
The Press-Enterprise

Based on a new study they published, two UC Riverside scientists advocate a daily dietary inclusion of fruit and vegetables to help prevent cancer.

They found that apigenin, a naturally occurring substance in fruit and vegetables, improves cancer cells' response to chemotherapy.

Xuan Liu, a professor of biochemistry, and Xin Cai, a postdoctoral researcher in her lab, report that ingesting apigenin offers a novel approach to stop tumor resistance to cancer treatment.

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Xin Cai, left, and Xuan Liu

Most cancer patients die because malignant growths are impervious to the chemicals used to kill them, the researchers said.

Their study, published Oct. 24 in the online early edition of the Proceedings of the National Academy of Sciences, suggests a possibility for developing safe chemotherapy with natural substances.

The National Institutes of Health funded the five-year study.

"The importance is that it opened a new window in terms of therapy," Liu, 49, said by phone.

Cancer patients would receive apigenin first, then undergo chemotherapy or radiation.

Apigenin moves a protein vital to killing tumors to the nucleus of cancer cells. Typically, low concentrations of this tumor suppressor, called p53, are diffused throughout healthy cells. But when cells are damaged, the protein migrates to the nucleus where it activates genes that halt uncontrolled cell growth and kills the damaged cells.

Liu said they don't yet understand the mechanism, but apigenin is able to switch on this protein and transport it to the nucleus of tumors.

"Apigenin is very effective in localizing p53 this way," Liu said.

Apigenin is found in fruit, including apples, cherries and grapes; vegetables and plants including parsley, artichoke, basil and celery; nuts; and plant-derived beverages, including tea and wine. Researchers have shown that apigenin has inhibited tumor growth in several kinds of cancer cells, including breast, colon, skin, thyroid, leukemia and pancreatic.

The U.S. Department of Health guidelines urge people to eat at least five daily servings of fruit and vegetables.

"I've been eating a lot more of them," Liu said.

In future research, Liu and Cai said they plan to test cancer therapies with compounds that are similar to apigenin but perform better.