

Compounds in Pomegranates May Prevent Growth of Hormone-Dependent Breast Cancer

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Summary:Pomegranate is enriched in a series of compounds known as ellagitannins that, as shown in this study, appear to be responsible for the anti-proliferative effect of the pomegranate.

5 Jan 2010 --- Eating fruit, such as pomegranates, that contain anti-aromatase phytochemicals reduces the incidence of hormone-dependent breast cancer, according to results of a study published in the January issue of *Cancer Prevention Research*, a journal of the American Association for Cancer Research.

Pomegranate is enriched in a series of compounds known as ellagitannins that, as shown in this study, appear to be responsible for the anti-proliferative effect of the pomegranate.

"Phytochemicals suppress estrogen production that prevents the proliferation of breast cancer cells and the growth of estrogen-responsive tumors," said principal investigator Shiu-an Chen, Ph.D., director of the Division of Tumor Cell Biology and co-leader of the Breast Cancer Research Program at City of Hope in Duarte, Calif.

Previous research has shown that pomegranate juice — *punica granatum L* — is high in antioxidant activity, which is generally attributed to the fruit's high polyphenol content. Ellagic acid found in pomegranates inhibits aromatase, an enzyme that converts androgen to estrogen. Aromatase plays a key role in breast carcinogenesis; therefore, the growth of breast cancer is inhibited.

Chen, along with Lynn Adams, Ph.D., a research fellow at Beckman Research Institute of City of Hope, and colleagues, evaluated whether phytochemicals in pomegranates can suppress aromatase and ultimately inhibit cancer growth.

After screening and examining a panel of 10 ellagitannin-derived compounds in pomegranates, the investigators found that those compounds have the potential to prevent estrogen-responsive breast cancers. Urolithin B, which is a metabolite produced from ellagic acid and related compounds, significantly inhibited cell growth.

"We were surprised by our findings," said Chen. "We previously found other fruits, such as grapes, to be capable of the inhibition of aromatase. But, phytochemicals in pomegranates and in grapes are different."

According to Gary Stoner, Ph.D., professor in the Department of Internal Medicine at Ohio State University, additional studies will be needed to confirm the chemopreventive action of Urolithin B against hormone-dependent breast cancer.

"This is an in vitro study in which relatively high levels of ellagitannin compounds were required to demonstrate an anti-proliferative effect on cultured breast cancer cells," said Stoner, who is not associated with this study. "It's not clear that these levels could be achieved in animals or in humans because the ellagitannins are not well absorbed into blood when provided in the diet."

Stoner believes these results are promising enough to suggest that more experiments with pomegranate in animals and humans are warranted.

Powel Brown, M.D., Ph.D., medical oncologist and chairman of the Clinical Cancer Prevention Department at the University of Texas M. D. Anderson Cancer Center, agreed with Stoner's sentiments and said these results are intriguing. He recommended that future studies focus on testing pomegranate juice for its effect on estrogen levels, menopausal symptoms, breast density or even as a cancer preventive agent.

"More research on the individual components and the combination of chemicals is needed to understand the potential risks and benefits of using pomegranate juice or isolated compounds for a health benefit or for cancer prevention," Brown said. "This study does suggest that studies of the ellagitannins from pomegranates should be continued."

Until then, Stoner said people "might consider consuming more pomegranates to protect against cancer development in the breast and perhaps in other tissues and organs."