

Study confirms safety, cancer-targeting ability of nutrient in broccoli, other vegetables

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Sulforaphane, one of the primary phytochemicals in broccoli and other cruciferous vegetables that helps them prevent cancer, has been shown for the first time to selectively target and kill cancer cells while leaving normal prostate cells healthy and unaffected.

The findings, made by scientists in the Linus Pauling Institute at Oregon State University, are another important step forward for the potential use of sulforaphane in [cancer prevention](#) and treatment. Clinical prevention trials are already under way for its use in these areas, particularly prostate and [breast cancer](#).

It appears that sulforaphane, which is found at fairly high levels in broccoli, cauliflower and other cruciferous vegetables, is an inhibitor of histone deacetylase, or HDAC enzymes. HDAC inhibition is one of the more promising fields of [cancer](#) treatment and is being targeted from both a pharmaceutical and dietary approach, scientists say.

"It's important to demonstrate that sulforaphane is safe if we propose to use it in cancer prevention or therapies," said Emily Ho, a principal investigator in the Linus Pauling Institute, lead author on the study and associate professor in the OSU Department of Nutrition and Exercise Sciences.

"Just because a phytochemical or nutrient is found in food doesn't always

mean its safe, and a lot can also depend on the form or levels consumed," Ho said. "But this does appear to be a phytochemical that can selectively kill [cancer cells](#), and that's always what you look for in cancer therapies."

The findings were published in *Molecular Nutrition and Food Research*, a professional journal. Research was supported by the National Cancer Institute, National Institute of [Environmental Health Sciences](#) and the OSU Agricultural Experiment Station.

The Linus Pauling Institute has conducted some of the leading studies on sulforaphane's role as an HDAC inhibitor – one, but not all, of the mechanisms by which it may help prevent cancer. HDACs are a family of enzymes that, among other things, affect access to DNA and play a role in whether certain genes are expressed or not, such as tumor suppressor genes.

Some of the mechanisms that help prevent inappropriate cell growth – the hallmark of cancer – are circumvented in cancer cells. HDAC inhibitors can help "turn on" these silenced genes and restore normal cellular function.

Previous OSU studies done with mouse models showed that prostate tumor growth was slowed by a diet containing sulforaphane.

"It is well documented that sulforaphane can target cancer cells through multiple chemopreventive mechanisms," the researchers wrote in their study. "Here we show for the first time that sulforaphane selectively targets benign hyperplasia cells and cancerous prostate cells while leaving the normal [prostate cells](#) unaffected."

"These findings regarding the relative safety of sulforaphane to normal tissues have significant clinical relevance as the use of sulforaphane

moves towards use in human clinical trials," they said.

The results also suggest that consumption of sulforaphane-rich foods should be non-toxic, safe, simple and affordable.

Provided by Oregon State University

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