

A step toward a new sunscreen? Plant agents show promise in preventing skin cancer

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Grapes provide some of the natural agents studied in the prevention of skin cancer in mice at the University of Texas Health Science Center at San Antonio. Credit: USDA Agriculture Research Service/photo by Bob Nichols

Maybe you worshipped the sun in your youth or weren't as meticulous as you should have been with sunscreen. If so, take heart: Scientists at The University of Texas Health Science Center San Antonio are finding that certain plant substances, when given in combinations, may suppress damage that can cause skin cancer.

The substances, which occur naturally in grapes, berries, walnuts and a

number of other plant-based foods, were tested on mice that had been genetically manipulated to be sensitive to skin cancer initiation and promotion/progression. Given in combination, even at low doses, the plant agents proved protective.

"On the basis of our research, supplements and creams or sunscreens may be developed, tested in humans and then used to prevent skin cancer," said Zbigniew Walaszek, Ph.D., research associate professor of pharmacology at the Health Science Center.

The natural agents include resveratrol, found in the skin of red grapes, and [grape seed extract](#). Others are calcium D-glucarate, a salt of D-glucaric acid, which is present in the human bloodstream and in many fruits and [vegetables](#), and ellagic acid, found in a host of berries and in walnuts.

Synergistic effects

Each of these compounds works in a different way, so giving them in combination is most protective. Scientists have administered the agents both topically and in the diet.

[In one study](#), the team induced skin cancer by shaving the backs of rodents and applying a chemical that produces a genetic mutation. This was done twice a week for four weeks. At the same time, researchers applied topical resveratrol and fed the mice diets supplemented with various combinations of the plant substances.

The team evaluated several outcomes, including thickness in the outer layer of the skin. An increase in thickness indicates that [precancerous cells](#) are multiplying. Researchers also monitored mutations in Ha-ras, an oncogene that is a [biomarker](#) of cancer initiation, and inflammation, which is important in tumor promotion.

Even low doses of plant agent combinations produced protective effects, while the plant substances given individually produced markedly less benefit.

Preventing cell transformation

Dr. Walaszek's colleague and wife, Margaret Hanausek, Ph.D., research associate professor of pharmacology, said the findings hold great potential for those most at risk for skin cancer and other cancers involving epithelial cells, including lung cancer.

"The combined inhibitory effects of different plant chemicals are expected to be particularly beneficial to, for example, smokers, former smokers or individuals with heavily tanned skin, who carry thousands of cells already initiated for malignant transformation," Dr. Hanausek said.

Research scientist Magdalena Kowalczyk, Ph.D., agreed: "Described combinations may be very useful in the prevention of skin cancer and other epithelial cancers in humans, achieving a high efficacy and potency with reduced side effects."

The team continues to look for the best combinations of the natural agents in suppressing different events during skin cancer development, she said.

Future directions

Researchers acknowledge that not all information - for example, effects on organs such as the lungs - can be gleaned from a skin cancer model. But they say it is an exciting start.

"Our next step is to go to an ultraviolet B light model of [skin cancer](#)

initiation and confirm our results," Dr. Walaszek said.

More information: Synergistic Effects of Combined Phytochemicals and Skin Cancer Prevention in SENCAR Mice. Magdalena C. Kowalczyk, Piotr Kowalczyk, Olga Tolstykh, Margaret Hanausek, Zbigniew Walaszek, Thomas J. Slaga. Published online first January 26, 2010; [doi: 10.1158/1940-6207](https://doi.org/10.1158/1940-6207). CAPR-09-0196 Cancer Prevention Research February 2010 3; 170

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