

# Katiyar Says Green Tea Can Help Ward Off Skin Cancer

*UAB Media Relations*

The American Cancer Society estimated that 2006 would bring with it 1 million new diagnoses of skin cancer in the United States – a number that could have been reduced by people limiting their exposure to the sun’s harmful ultraviolet rays.

But not everyone can avoid the risk. Many people have jobs that keep them outside most of the day, and even those who have limited exposure to the sun’s rays are at risk.

Santosh Katiyar, Ph.D., an associate professor in dermatology, has been studying ways for humans to protect themselves from skin cancer for 16 years, including the past six years here at UAB.

He says the answer is found in green tea.

Katiyar is convinced that the rich polyphenol content found in green tea is the most potent tumor-inhibitor found in nature. His studies show that an antioxidant called epigallocatechin-3-gallae (EGCG), which is found in green tea, appears to protect the skin from ultraviolet radiation-induced damage and prevent skin tumor formation.

“I’ve found that green tea, whether applied topically or taken orally, is certainly beneficial in the area of cancer prevention, at least in laboratory animal models,” Katiyar says. “Green tea prevents UV radiation-induced suppression of the immune system, which has been considered as a risk factor for the development of skin cancer.”

## **Common beverage**

Skin is the largest organ of the body and the first defense barrier for the body from external physical, chemical and environmental pollutants, including solar ultraviolet radiation.

According to the American Cancer Society, more than 1 million cases of basal cell or squamous cell cancers occur annually. Skin cancer is associated with the epidermal layer and its cell types.

Exposure to UV radiation is the key factor in the initiation of skin disorders, such as wrinkling, scaling, dryness, mottled pigment abnormalities consisting of

hypopigmentation and hyperpigmentation and skin cancers. The solar UV light that penetrates the skin's top layer often strikes DNA molecules in the chromosomes, causing harmful mutations which leads to initiation of skin cancer.

Where does green tea fit in? Next to water, tea is the most commonly consumed beverage worldwide because of its characteristic aroma, flavor and health benefits. Of total tea consumption, approximately 78 percent is consumed as black tea, mainly in Western and some Asian countries. Some 20 percent is consumed as green tea, primarily in Asian countries.

Katiyar recently had articles published in *Cancer Research* and *Clinical Cancer Research* that stated EGCG prevents UV-induced skin cancer in mice through the enhancement of an immunoregulatory cytokine interleukin-12-dependent DNA-repair device

“The interleukin-12 molecule has the ability to repair UV-induced DNA damage,” Katiyar says. “The polyphenols in green tea have strong antioxidant and anti-inflammatory properties, but they enhance the production of interleukin-12. And if the interleukin-12 can play a role in DNA repair, then they can prevent skin cancer.”

In addition to the tea, several green tea-based cream products also are available for purchase over the counter. The U.S. Food and Drug Administration says there is not enough evidence to support claims that green tea – whether used topically or consumed in a beverage – prevents or reduces the risk of any type of cancer, but Katiyar hopes more clinical studies with adequate controls such as race, diet and frequency of tea consumption will show green tea's positive effects.

### **Cancer hits home**

Katiyar, who came to the United States from India 16 years ago with a Ph.D. in biochemistry, is like many people when it comes to cancer: He knows the effect the disease can have on people's lives. He lost his mother to breast cancer in 1983.

“My parents spent lots of time, energy and money on my education, a very good education, but I could do nothing to help my mother in her struggle to breast cancer,” Katiyar says. “That's when I decided I wanted to do cancer chemoprevention research.

“I know there are still millions of other mothers out there who need protecting.”

He says green tea is one way to do just that. Katiyar says green tea purchased in Asian markets is likely to be the highest quality of tea to drink. He suggests five to six cups of green tea a day would be beneficial to those at especially high risk, such as people with fairer skin.

Preparation of the tea is a key, he says. Boil the water and steep approximately one gram of green tea leaves, covered, for four or five minutes before drinking. He says that in that

amount of time the polyphenols will dissolve in the warm water. Do not boil the water with the leaves in it, he says, or the polyphenols will not be as active.

“It’s crucial that people consume the tea on a regular basis to achieve the maximum benefits,” Katiyar says. “Constant, regular consumption will be helpful in preventing skin cancer.”

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