

# Common skin cancer can signal increased risk of other cancers, researchers say

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Human skin structure. Credit: Wikipedia

People who develop abnormally frequent cases of a skin cancer known as basal cell carcinoma appear to be at significantly increased risk for the development of other cancers, including blood, breast, colon and prostate cancers, according to a preliminary study by researchers at the Stanford University School of Medicine.

The increased susceptibility is likely caused by mutations in a panel of proteins responsible for repairing DNA damage, the researchers found.

"We discovered that people who develop six or more basal cell carcinomas during a 10-year period are about three times more likely than the general population to develop other, unrelated cancers," said Kavita Sarin, MD, Ph.D., assistant professor of dermatology. "We're hopeful that this finding could be a way to identify people at an increased risk for a life-threatening malignancy before those cancers develop."

Sarin is the senior author of the study, which will be published online Aug. 9 in *JCI Insight*. Medical student Hyunje Cho is the lead author.

## **Largest organ**

The skin is the largest organ of the body and the most vulnerable to DNA damage caused by the sun's ultraviolet rays. Try as one might, it's just not possible to completely avoid sun exposure, which is why proteins that repair DNA damage are important to prevent skin cancers like basal cell carcinoma.

Most of the time this system works well. But sometimes the repair team can't keep up. Basal cell carcinomas are common—more than 3 million cases a year are diagnosed in the United States alone—and usually highly treatable.

Sarin and Cho wondered whether the skin could serve as a kind of canary in the coal mine to reveal an individual's overall cancer susceptibility. "The skin is basically a walking mutagenesis experiment," Sarin said. "It's the best organ to detect genetic problems that could lead to cancers."

Sarin and Cho studied 61 people treated at Stanford Health Care for unusually frequent basal cell carcinomas—an average of 11 per patient over a 10-year period. They investigated whether these people may have mutations in 29 genes that code for DNA-damage-repair proteins.

"We found that about 20 percent of the people with frequent basal cell carcinomas have a mutation in one of the genes responsible for repairing DNA damage, versus about 3 percent of the general population. That's shockingly high," Sarin said.

Furthermore, 21 of the 61 people reported a history of additional cancers, including blood cancer, melanoma, prostate cancer, breast cancer and colon cancer—a prevalence that suggests the frequent basal cell [carcinoma](#) patients are three times more likely than the general population to develop cancers.

### **'A strong correlation'**

To confirm the findings, the researchers applied a similar analysis to a large medical insurance claims database. Over 13,000 people in the database had six or more basal cell carcinomas; these people also were over three times more likely to have developed other cancers, including colon, melanoma and blood cancers. Finally, the researchers identified an upward trend: the more basal cell carcinomas an individual reported, the more likely that person was to have had other cancers as well.

"I was surprised to see such a strong correlation," Sarin said. "But it's also very gratifying. Now we can ask patients with repeated basal cell carcinomas whether they have family members with other types of cancers, and perhaps suggest that they consider genetic testing and increased screening."

The researchers are continuing to enroll Stanford patients in the study,

which is ongoing, to learn whether particular mutations in genes responsible for repairing DNA damage are linked to the development of specific malignancies. They'd also like to conduct a similar study in patients with frequent melanomas. But they emphasized that there's no reason for people with occasional basal cell carcinomas to worry.

"About 1 in 3 Caucasians will develop [basal cell carcinoma](#) at some point in their lifetime," Sarin said. "That doesn't mean that you have an increased risk of other cancers. If, however, you've been diagnosed with several basal cell carcinomas within a few years, you may want to speak with your doctor about whether you should undergo increased or more intensive [cancer](#) screening."

Provided by Stanford University Medical Center

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