New clues to skin cancer development show sunscreen is not enough

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(Medical Xpress)—Scientists have shown that sunscreen cannot be relied upon alone to prevent malignant melanoma, the most deadly form of skin cancer, according to research* published in *Nature*.

The work supports the approach taken by public health campaigns that call for people to use a combination of shade and clothing to protect their skin, applying sunscreen to the areas you can't cover.

The research explains more about the mechanism by which UV light leads to melanoma and also explores the extent to which sunscreen is able to prevent UV light from damaging healthy cells.

In the study, carried out at Cancer Research UK's Manchester Institute, based at the University of Manchester, and at The Institute of Cancer Research, London, scientists examined the molecular effects of UV light on the skin of mice at risk of melanoma** and whether disease development was blocked by sunscreen.

UV light directly damages the DNA in the skin's pigment cells, increasing the chances of developing melanoma. Crucially, the researchers show that it causes faults in the p53 gene, which normally helps protect from the effects of DNA damage caused by UV light.

The study also showed that sunscreen can greatly reduce the amount of DNA damage caused by UV, delaying the development of melanoma in the mice. But, importantly, the study also found that sunscreen did not offer complete protection and UV light could still target p53 to induce melanoma, albeit at a reduced rate.

Professor Richard Marais, study author and Cancer Research UK scientist, based at the University of Manchester, said: "UV light has long been known to cause melanoma skin cancer, but exactly how this happens has not been clear. These studies allow us to begin to understand how UV light causes melanoma.

"UV light targets the very genes protecting us from its own damaging effects, showing how dangerous this cancer-causing agent is. Very importantly, this study provides proof that sunscreen does not offer complete protection from the damaging effects of UV light.

"This work highlights the importance of combining sunscreen with other

strategies to protect our skin, including wearing hats and loose fitting clothing, and seeking shade when the sun is at its strongest."

Dr Julie Sharp, head of health information at Cancer Research UK, said: "We've known for some time that sunscreen, when applied properly, can help protect our skin from the harmful effects of the sun's rays. But people tend to think they're invincible once they've put it on and end up spending longer out in the sun, increasing their overall exposure to UV rays.

"This research adds important evidence showing that sunscreen has a role, but that you shouldn't just rely on this to protect your skin. It's essential to get into good sun safety habits, whether at home or abroad, and take care not to burn – sunburn is a clear sign that the DNA in your skin cells has been damaged and, over time, this can lead to skin cancer.

"When the sun is strong, pop on a t-shirt, spend some time in the shade and use a sunscreen with at least SPF15 and good UVA protection."

More information: Amaya Viros et al., "Ultraviolet radiation accelerates BRAF-driven melanomagenesis by targeting TP53." *Nature*, 2014, DOI: 10.1038/nature13298

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