

# A substance from bacteria can lead to allergy-free sunscreen

October 25 2011

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As the realisation that radiation emitted by the sun can give rise to skin cancer has increased, so also has the use of sunscreen creams. These creams, however, can give rise to contact allergy when exposed to the sun, and this has led to an increasing incidence of skin allergy. Scientists at the University of Gothenburg and Chalmers University of Technology are leading the hunt for a natural UV filter that does not have undesired effects.

"Unfortunately, several of the chemical UV filters used in sunscreens cause contact allergy, either of themselves or when they are exposed to sunlight. We have therefore studied a UV filter, scytonemin, that is found in certain bacteria. We have managed to produce this substance artificially in the laboratory", says Isabella Karlsson, research student in the Department of Chemistry at the University of Gothenburg.

Sunlight contains two types of [UV radiation](#). The type known as "UVA" penetrates deeply into the [skin](#) and causes the pigment that we already have to darken. UVA, however, also causes the skin to age prematurely. The most common chemical UVA filter on the market is 4-tert-butyl-4'-methoxy dibenzoylmethane, BM-DBM, which is known to cause photocontact allergy when it reacts on the skin. Isabella Karlsson has shown that BM-DBM breaks down in UV light to form several different products. One of these, a group of substances known as "arylglyoxals", proved to be very potent contact [allergens](#).

Isabella Karlsson also describes in her thesis studies of a relatively new

UV filter, octocrylene. The popularity of octocrylene has increased a great deal since it is not broken down by sunlight, and it stabilises other substances such as, for example, BM-DBM. However, several reports of [allergic reactions](#) to octocrylene have appeared in recent years. Clinical studies and [laboratory experiments](#) have suggested that octocrylene can cause contact allergy, both of itself and when it is exposed to sunlight. Many patients who reacted by developing photocontact allergy to octocrylene developed photocontact allergy also to the drug ketoprofen.

"We tested 172 patients with suspected skin reactions to sunscreen creams and/or the drug ketoprofen in one of our studies. It turned out that 23 of these patients reacted to the UV filter octocrylene. Five of them were diagnosed with contact allergy and the other 18 with photocontact allergy."

So Isabella Karlsson is placing her hopes onto the natural product scytonemin. She has managed to produce this substance artificially, in collaboration with Chalmers University of Technology. Scytonemin is produced by certain cyanobacteria that live in habitats exposed to very strong sunlight. Scytonemin absorbs [UV light](#) and thus protects the bacteria from being damaged by the sun's radiation. More research will be required, however, before it can be added to sunscreen creams.

Provided by University of Gothenburg

Citation: A substance from bacteria can lead to allergy-free sunscreen (2011, October 25)  
retrieved 20 April 2024 from

<https://phys.org/news/2011-10-substance-bacteria-allergy-free-sunscreen.html>

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