

Knee protectors can form allergenic substances on the skin

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Common rubber products can form isothiocyanates in contact with skin and cause contact allergy. This is the conclusion of research carried out at the University of Gothenburg (Sweden). Isothiocyanates are a group of reactive substances that are potent contact allergens.

"Substances that appear at first glance to be harmless can cause [allergic reactions](#) since skin enzymes may help to form new, allergenic substances from them, giving rise to dermatitis and other skin problems. This is the case for isothiocyanates, which are formed on the skin following repeated contact with rubber", says Kristin Samuelsson of the Department of Chemistry at the University of Gothenburg.

Around one in five adults in Europe suffers from contact allergy against one or several chemical substances to which they are exposed. The most common allergy is against nickel, while many people suffer from contact allergy against, for example, perfume. A substance must bind to proteins in the skin before it can give rise to an allergy. This means that substances must be chemically reactive, if they are to cause an allergic reaction. Isothiocyanates are potent contact allergens that occur naturally in vegetables. They are used also in technical products.

Kristin Samuelsson has used fluorescent isothiocyanates to study how allergenic substances are absorbed by the skin and lymph nodes, after being applied to the skin. The results show that the reactive isothiocyanates are mainly restricted to the outermost layer of skin (known as the "stratum corneum"), which consists of dead cells. Even so,

the isothiocyanates that were tested were potent [allergens](#).

Diphenylthiourea is a substance that is used in the production of rubber, including the neoprene rubber that is used in mouse mats, wetsuits, knee protectors and other products with which we have close and frequent contact. Isothiocyanates are among the substances that are formed from diphenylthiourea when it is applied to skin.

The number of patients with reported allergies against neoprene rubber is not actually very high, but this may be because it is difficult to confirm such allergies. The results presented in the thesis have led to the initiation of a new study at the Skin Clinic, Sahlgrenska University Hospital, in which patients with suspected allergy against neoprene rubber will be tested using the isothiocyanate that is formed in the skin. Testing with the active allergen increases the chances of detecting cases of rubber allergy, and thus providing the appropriate treatment and advice for the patients. Identifying allergenic substances in common products will also make it possible to reduce the exposure of the general population to such substances.

The thesis: Isothiocyanates as skin sensitizers. Bioactivation and distributor in [skin](#) and draining [lymph nodes](#) has been successfully defended.

Provided by University of Gothenburg

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