

New diagnostic test to distinguish psoriasis from eczema

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In some patients, the chronic inflammatory skin diseases psoriasis and eczema are similar in appearance. Up to now, dermatologists have therefore had to base their decision on which treatment should be selected on their own experience and an examination of tissue samples.

A team of researchers at the Helmholtz Zentrum München and the Technical University of Munich (TUM) have now analyzed the molecular processes that occur in both diseases and discovered crucial differences. This has enabled them for the first time to gain a detailed understanding of the ways in which the respective disease process occurs. Building on this knowledge, the scientists, led by Dr. Stefanie Eyerich and Prof. Dr. Kilian Eyerich as well as Prof. Dr. Fabian Theis, have developed a diagnostic procedure which in practice enables psoriasis and eczema to be reliably differentiated from one another on the basis of only two genes.

A better understanding of molecular processes

"Both diseases have a highly complex appearance, which often varies widely from one patient to another," says Dr. Stefanie Eyerich, who heads the Specific Immunology working group at the Institute of Allergy Research (IAF) at the Helmholtz Zentrum München. "This has led previous attempts to compare their molecular signature to fail." In this study, the researchers identified 24 patients who were suffering simultaneously from psoriasis and eczema and in each analyzed at the

molecular level the characteristic differences they demonstrated between psoriasis and eczema compared to clinically unremarkable skin.

"We were thus able to drastically reduce random genetic or environmental influences and gain a detailed picture of the development of these two diseases," explains Prof. Fabian Theis of the Institute of Computational Biology (ICB) at the Helmholtz Zentrum München.

Paving the way for personalized medicine

In recent years, many new specific treatments have been developed for psoriasis and eczema. However, in each case, these are only effective for one or other of the two diseases. And they are very expensive: one such treatment generally costs several tens of thousands of euros per year, per patient. The ability to make an exact diagnosis therefore has a considerable economic impact.

If it cannot be clearly determined on presentation which of the two diseases is involved, the newly developed diagnostic tool will help to differentiate them. It involves a test which compares samples of diseased and healthy skin and is concluded within one day. The researchers have now filed a patent application for it.

The procedure, moreover, marks the first step towards the introduction of personalized medicine also for chronic inflammatory skin diseases. "Whereas this is practiced increasingly in oncology, for example in the form of mutation analyses and the subsequent decision in favor of the best individual treatment option, it is not common in the case of inflammatory skin diseases," says Kilian Eyerich of the Clinic and Polyclinic for Dermatology at the Technical University of Munich.

The researchers plan to pursue this path with a view to characterizing even more precisely the [molecular processes](#) involved in inflammatory

[skin diseases](#) and combining them with clinical information, such as the choice of certain treatments. In this way, their goal is to determine the best possible treatment option for each individual patient.

More information: Quaranta, M. et al, (2014), "Intra-individual genome expression analysis reveals a specific molecular signature of psoriasis and eczema," *Sci Transl Med*, 2014 July 9th; Vol. 6, Issue 244, p. 244ra90; Sci. Transl. Med. DOI: 10.1126

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