

How solvents affect the skin

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Researchers at Lund University in Sweden have developed a method that makes it possible to see how individual molecules from solvents in skin creams, medicated ointments and cleaning products affect and interact with the skin's own molecules.

In the study, the researchers have examined how molecules added to the [skin](#) through various liquids and creams affect the skin, and how the same molecules are affected by being inside the skin.

Only a small portion of the skin's molecules is in a fluid state. However, these mobile molecules are important as they determine many of the skin's properties, such as elasticity and barrier function. By using a type of solid state NMR (Nuclear Magnetic Resonance), the researchers were able to detect changes in the fluid skin molecules when they interact with the molecules of different solvents. In addition, the [researchers](#) were able to identify how the added molecules are affected by their interaction with molecules of the skin.

"These types of measurements have not been done before. Our results complement previous studies that have measured how molecules penetrate the skin under different conditions. Our contribution is that we have now increased our understanding of how molecules - both added components and skin molecules - are affected by each other", says Emma Sparr, professor at the Department of Chemistry at Lund University.

The results can be applied in various fields that involve products that

come in contact with the skin, such as hygiene products, cosmetics and pharmaceuticals. While a medicated ointment must be able to transport active [molecules](#) through the skin, and a skin cream may be intended for making the skin softer and smoother, a disinfectant should not affect the skin's properties.

"Through an increased understanding of molecular mechanisms we are able to more efficiently influence and regulate skin properties", says Emma Sparr.

The study was conducted by Professor Emma Sparr together with Professor Daniel Topgaard and doctoral student Quoc Dat Pham.

More information: Quoc Dat Pham et al, Tracking solvents in the skin through atomically resolved measurements of molecular mobility in intact stratum corneum, *Proceedings of the National Academy of Sciences* (2017). [DOI: 10.1073/pnas.1608739114](https://doi.org/10.1073/pnas.1608739114)

Provided by Lund University

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