

A molecular search for happier skin

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Leeds scientists are using the most sophisticated techniques to tackle a question almost as old as mankind itself - what makes skin feel good, and why?

The research is coordinated at the University of Leeds by Professor Peter Olmsted of the School of Physics and Astronomy, who is bringing [atomic force microscopy](#), computer simulation and theoretical physics to bear on the problem, within a larger collaborative project led by Dr Massimo Noro at Unilever R&D Port Sunlight. The aim is to design better [skin](#) products that appeal to consumers by working well - and making them feel good too.

Prof Olmsted, whose research expertise is in soft condensed matter such as polymers and liquid crystals, will examine the properties of the lipid bilayers that are found in the stratum corneum membrane, the outermost layer of skin which is just 50-100 microns thick - about a tenth of the thickness of a sheet of paper.

"Essentially our work is an attempt to understand in scientific terms what 'feeling good' means," says Professor Peter Olmsted.

The Leeds team, which also includes Dr Simon Connell, will concentrate on understanding how the extremely complex composite structure of skin gives it its unique properties of strength and elasticity. Scientists will be able to construct a profile of the skin lipids that is accurate up to a millionth of a millimetre.

The team will use this information to carry out experiments and make theoretical calculations that model how skin behaves at a molecular level to the ingredients of personal care products, from simple water molecules to complex oils.

"In examining the science of these membranes we hope to come up with design rules for products that work better and are more appealing to the person who is using them," adds Professor Olmsted.

"It's about caring for the natural barrier which is the skin surface. We will be testing the various ingredients used in these products to see what effects they have. We wish to link these effects to the science of the mechanics and permeability of complex membranes."

As skin grows from the inside of the body towards the outside, cells are pushed to the surface layers of the skin. They over-express certain proteins that form mechanical "bricks", held together by a "mortar" made of special lipid molecules called ceramides, in a form that only exists in skin. The research group is interested in how the special features of these molecules contribute to the elastic, strong, and supple object that is skin.

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And Prof Olmsted is philosophical about why this has not been the focus of research in the past: " A lot of work has been done but there is an awful lot further to go, because this is a very complicated system to understand and, from my own personal point of view, contains a host of scientifically interesting questions."

Source: University of Leeds ([news](#) : [web](#))

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