

# Researchers show once and for all that liposomes cannot function as carriers transporting active agents into the skin

March 7 2016, by Birgitte Svennevig

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Many cosmetic companies praise liposomes for their alleged ability to transport rejuvenating and nourishing agents deep into the skin, but also drug researchers have high hopes for liposomes: If they can carry

nourishing agents through the skin, then they can also carry medical agents into the body.

But now a new study from University of Southern Denmark finds that [liposomes](#) cannot penetrate the skin's barrier without breaking.

The study is published in the journal *Plos One*. The authors include postdoc Jes Dreier and Associate Professor Jonathan Brewer from the Department of Biochemistry and Molecular Biology, University of Southern Denmark.

The study follows a previous study from 2013, in which the research team showed that liposomes lose their cargo of agents the moment they meet the skin's surface.

"This time we use a new method, and once and for all we establish that intact liposomes cannot penetrate the skin's surface. Therefore, we need to revise the way we perceive liposomes - especially in the skin care industry, where liposomes are perceived as protective spheres transporting agents across the skin barrier," says Jonathan Brewer.

The research group is the first in the world to use a special microscope, called a nanoscope, to study the skin. With this technique it is possible to directly see the individual molecules and liposomes.

One can study their activity and the processes that occur at the molecular level, and this provides a valuable insight into how cells function.

The studies have revealed that liposomes cannot carry [active agents](#) into the skin. However, the liposomes may in fact in some way help the agents get underway.

"When the liposomes hit the skin and break, it is not certain that the

active agents are wasted. It may well be that a chemical reaction starts, which somehow helps the [agents](#) travel through the [skin](#) barrier. So in a way you could say that the liposomes might work - but then it is in a different way than the beauty industry tells us," the researchers said.

They now recommend that science changes its focus towards these possible chemical reactions.

**More information:** Jes Dreier et al. Superresolution and Fluorescence Dynamics Evidence Reveal That Intact Liposomes Do Not Cross the Human Skin Barrier, *PLOS ONE* (2016). [DOI: 10.1371/journal.pone.0146514](#)

Provided by University of Southern Denmark

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