

Mechanism of Nanoparticle-Mediated Dermal Drug Delivery

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Smart drug delivery systems are of increasing interest for various applications including dermal drug delivery. Overall, facilitated and targeted delivery is aimed for with the ultimate goal to increase the therapeutic efficiency and to reduce systemic side effects. Enabling these visions, particularly soft matter nanocarriers like liposomes, micelles, nanoparticles based on biological or synthetic materials are considered as potential delivery systems since they can transport a broad variety of molecules, show good biocompatibility, can easily be prepared and surface modified, and allow stimuli-responsive payload releases.

Efficient dermal drug delivery using different types of nanoparticles was shown repeatedly in the past. As for today, however the underlying mechanism of facilitated drug transport is still ambiguous in most cases. Several modes of transport such as skin absorption of the nanoparticles themselves or skin barrier-altering effects of the nanocarriers are discussed, but little is known for sure so far.

In this presentation, the different hypothesis will be highlighted and discussed in the current scientific context aiming to provide an overview about the state of knowledge in relation to the mechanism of nanoparticle-mediated drug transport into the skin.

