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Lipid Nanoparticles for Improved Topical Application

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Due to lower risk of systemic side effects topical treatment of disease appears favourable, yet the stratum corneum counteracts the penetration of xenobiotics into viable skin. Particulate carrier systems may mean an option to improve dermal penetration. Lipid nanoparticles (LN) were developed at the beginning of the 1990s as an alternative carrier system to emulsions, liposomes and polymeric nanoparticles. LN for the use in topical cosmetic and pharmaceutical formulations epidermal lipids are found in high amounts within the penetration barrier, lipid carriers attaching themselves to the skin surface and allowing lipid exchange between the outermost layers of the stratum corneum and the carrier appear promising. Besides liposomes, solid lipid nanoparticles (SLN) and nanostructured lipid carriers (NLC) have been studied intensively. Here we describe the potential of these carrier systems and compare the dermal uptake from SLN and NLC to the one of alternative vehicle systems. A special focus is upon the interactions of active ingredients and the lipid matrix as well as the quantification of dermal penetration.