Synopsis of Original Research Paper

The skin penetration mechanism of high molecular weight compounds based on the skin penetration behavior of hyaluronic acid nanoparticles

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Skin administration is a simple method of therapeutic and cosmetic application. However, the protective barrier provided by the skin makes it challenging to achieve delivery of high molecular weight compounds. Efforts to improve the penetration of hyaluronic acid (HA) have yielded nanoparticulate polyion complexes of HA with poly-L-lysine (HANP), which act as vehicles for delivering HA deeper into the skin. However, the mechanism for this effect and the response of HANP to the skin environment have not been explored. In this study, the penetration of HANP in skin is compared with that of HA, and differences in the pathways are identified. In addition, the properties of the particles in a simulated skin environment are assessed and HANP are found to show morphological changes in response to ions. These findings are expected to pave the way for future transdermal delivery of other high molecular weight ionic compounds such as proteins.