Synopsis of Original Research Paper

Effect of Cosmetic Excipients on ABC transporters in the skin

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The skin represents physical and biochemical barrier between the body and the environment, serving to exclude xenobiotics and microorganisms and to prevent unregulated water loss from the body into the atmosphere. The physical barrier is mainly localized in stratum corneum (SC) whereas a biochemical barrier also exists in skin epithelial cells beneath the SC. The biochemical barrier includes metabolic enzymes and transporters that mediate detoxification and efflux of xenobiotics. This barrier has an important influence on absorption of xenobiotics, though the mechanisms of its effects on the absorption generally remain to be fully established. We have recently clarified the role of two ATP binding cassette (ABC) transporters, P-glycoprotein (P-gp) and breast cancer resistance protein (BCRP), in transdermal absorption of a typical substrate *in vivo*. This finding may imply the possible interaction of these ABC transporters with cosmetic/pharmaceutical excipients, leading to the change in transdermal permeation of constituents/drugs. Therefore, the purpose of the present study was to clarify the inhibition potential of several cosmetic excipients on P-gp and BCRP. The inhibitory effect was assessed by the uptake study of a typical BCRP substrate Hoechst33342 in MDCKI cells stably transfected with *BCRP* gene (MDCKI/BCRP). In the presence of several excipients, uptake of Hoechst33342 in MDCKI/BCRP cells was higher than that in their absence, suggesting that BCRP is inhibited by those excipients. Such inhibition profile was found to be concentration-dependent for the excipients. The inhibition was further demonstrated by the transcellular transport study of Hoechst33342 in MDCKI/BCRP cells in the presence or absence of those excipients. It was found that the inhibition potential is partially correlated with a certain physicochemical parameter. Thus, our findings suggest that some of cosmetic excipients inhibit the function of BCRP. Further studies are required to clarify the relevance of such inhibition with the change in transdermal permeation of cosmetic constituents and pharmaceutical drugs.