

〈原 著〉

## エチルパラベンを透過指標物質とする界面活性剤の モルモットの剥離皮膚への影響

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### Effect of Surfactants on Guinea-Pig Excised Skin Using Ethylparaben as a Permeant

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#### Abstract

In order to estimate the safety of surfactants on skin or their transdermal permeation-enhancing activity, the effect of 8 anionic, 9 cationic and 12 nonionic surfactants on excised guinea-pig skin was studied in a Franz diffusion cell by using ethylparaben (EP) as a permeant. The skin was treated with 10 mM anionic or cationic surfactants' solutions and 0.5% nonionic surfactants' solutions at 37°C for 2 h, then permeation of EP across it was estimated. Sodium dodecanesulfonate, cetyltrimethyl ammonium chloride, polyoxyethylene (20) sorbitan monolaurate and polyoxyethylene (10) oleyl ether enhanced the steady-state flux of EP, being more effective than sodium dodecyl sulfate as a positive control. The effect of anionic surfactants on the skin depended on the aliphatic hydrocarbon chain length and was most pronounced with 12-carbon chain. The result agreed with those obtained from methylparaben (MP) and salicylic acid (SA) as a permeant already reported. On the contrary the effect of cationic surfactants on the skin was not remarkable on the aliphatic hydrocarbon chain length. The effects of anionic surfactants on the steady-state flux of EP were compared with those of both MP and SA. Correlation coefficients between them were 0.970 ( $p < 0.05$ ) and 0.916 ( $p < 0.05$ ) and the regression lines were  $y = -4.9556 + 1.1391x$  and  $y = 6.028 + 1.0434x$ , respectively. No correlation was observed between the steady-state flux of EP and the hydrophile-lipophile balance of nonionic surfactants.

**Key words:** surfactant, excised guinea-pig skin, ethylparaben, permeation.