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Effect of microplasma irradiation on skin barrier function KAZUO SHIMIZU, Organization for Innovation and Social Collaboration, Shizuoka University, NHAT AN TRAN, Graduate school of engineering Shizuoka University, MARIUS BLAJAN, Organization for Innovation and Social Collaboration, Shizuoka University — This study investigates the feasibility of atmospheric-pressure argon microplasma irradiation (AAMI) to promote drug delivery through skin. Yucatan micropig skin was used as a biological object for evaluation of in vitro percutaneous absorption. The changes in lipids, proteins and water content of the pig stratum corneum (SC) after AAMI were compared to those of a tape stripping test (TST) and plasma jet irradiation (PJI) using attenuated total reflection-Fourier transform infrared spectroscopy analysis. The significant reduction in the methylene stretching modes absorbance resulted in the disturbance in the SC lipids caused by AAMI was observed at 2850 and 2920 cm^{-1}. Moreover, as the result of TST, trans-epidermal water loss (TEWL) after both AAMI and PJI were also increased, that could lead to a decrease of barrier function of SC, and could enhance the transdermal absorption of drugs. Under the conditions of this study, TEWL value of 5 minutes AAMI (35.92 ± 3.48 g/m^2h) was approximately the same as that value of 10 times TST (34.30 ± 3.54 g/m^2h), that makes the effect of these manipulations on the surfaces is considered to be at the same levels. Furthermore, unlike the obtained microscopic observation from PJI, there was no thermal damage observed on the skins after AAMI.

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