

Enhanced skin delivery of polyphenols by microemulsion and prevention against photoaging

Shuji Kitagawa

Kobe Pharmaceutical University

To improve the efficiency of the intradermal delivery of polyphenols, we tried to clarify the usefulness of microemulsion by *in vitro* study on excised guinea pig dorsal skin and Yucatan micropig skin. Using microemulsion consisting of isopropyl myristate, 150mM NaCl solution, Tween 80 and ethanol as a vehicle, the solubility of all the polyphenols such as quercetin, genistein and chlorogenic acid markedly increased and significant amounts of polyphenols were delivered to the skin. For hydrophobic polyphenols water-in-oil microemulsion was more effective. On the other hand, for hydrophilic polyphenols oil-in water microemulsion was more effective. Polyphenols retained in the skin significantly inhibited lipid peroxidation *in vitro* dose-dependently. Furthermore, pretreatment of guinea pig dorsal skin with polyphenols such as genistein and chlorogenic acid, which were contained in microemulsion gel, prevented UV irradiation-induced erythema formation. These findings indicate the potential use of microemulsion for the delivery of polyphenols to protect skin against UV-induced oxidative damage.