**In vitro permeation of several drugs into skins from humans, pigs, dogs, rats, and hairless mice, and into the human nail plate**

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Evaluations of the effectiveness of topical applied drugs and the safety of cosmetic ingredients with respect to the penetration of the nail plate are considered to be extremely useful in the development of medicine. In studies of percutaneous absorption of material such as topical applied drugs and cosmetic ingredients into skin, it is important to obtain quantitative information on the passage from the stratum corneum surface to the systemic circulation. Among the advantages of in vitro methods are the ease in which comparison of the permeation into human skin with that into skins from other species can be made and that any formulation can be studied, including compounds extensively metabolized in the body.

We used a Franz-type diffusion cell for permeation experiments, adjusting the cell for the test of permeation into the human nail plate. The species differences in skin permeability (Kp) of several drugs were determined using excised skin samples from humans, pigs, dogs, rats, and hairless mice. The drugs selected were antifungals, anti-inflammatory drugs, and steroidal agents. In vitro permeation into human skin and human nail plate was compared.

**EFFECT OF WATER SOLUBILIZATION OF α-TOCOPHEROL ON THE PHARMACOKINETICS AFTER ORAL ADMINISTRATION IN RATS**

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Water solubilization is a fundamental technique which enables to dissolve highly lipophilic compounds into water. It is expected that water-insoluble compounds in dietary supplements could be mixed in foods and drinks by the solubilization approach. α-Tocopherol is a fat-soluble vitamin known as vitamin E. The aim of this study was to determine the effect of water solubilization of α-tocopherol on the pharmacokinetics after oral administration in rats. Water-soluble formulation of α-tocopherol (10 %) was prepared. Male Wistar rats (250-300 g) were fasted 24 h before dosing and orally received α-tocopherol as water-soluble formulation or oil formulation at a dose of 100 mg/kg body weight. Blood samples were collected until 24 h after the oral administration. Plasma concentrations of α-tocopherol were determined by HPLC with electrochemical detector. The plasma concentration of α-tocopherol in rats significantly increased after oral administration of both water-soluble and oil formulation, and reached the maximum level at 6 h. At 2 and 4 h after administration, plasma concentrations of α-tocopherol in rats treated with water-soluble formulation were significantly higher than those in rats treated with oil formulation. Furthermore, there were significant (1.7 and 1.4-fold, respectively) increases in the maximum plasma concentration and the area under the plasma concentration time curve of water-soluble α-tocopherol formulation compared with the oil formulation. These results suggest that water solubilization of α-tocopherol increases both rate and amount for oral absorption of this agent.