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Author	小股, 泰子(Komata, Yasuko) 金子, 明子(Kaneko, Akiko) 藤江, 忠雄(Fujie, Tadao)
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In Vitro Percutaneous Absorption of Thiamine Disulfide through Rat Skin from a Mixture of Propylene Glycol and Fatty Acid or Its Analog*

Yasuko KOMATA, Akiko KANEKO and Tadao FUJIE

小股泰子，金子明子，藤江忠雄

Percutaneous absorption of thiamine disulfide, (TDS), a lipophilic derivative of thiamine, from a mixture of propylene glycol (PG) and fatty acid (FA) or its analog through rat skin was tested in vitro. Lauric acid (12 : 0) enhanced the absorption depending on its concentration in PG and showed a maximal enhancement at 10% w/v. At 10% w/v, lauryl alcohol also enhanced the absorption, but less than 12 : 0, while lauric acid methyl ester suppressed the absorption. The flux of TDS did not depend on the solubility of TDS in the vehicle, but on the permeability coefficient. From these results, it is suggested that FA increases the permeability coefficient not only because FA increases TDS diffusion by disrupting lipid packing in the stratum corneum but also, FA increases TDS partition to lipid phase by interacting with TDS.

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