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Enhancement of Skin Permeation: the Metabolic Approach

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To enhance the skin permeability of a drug, the barrier function of the skin must be overcome at least temporarily. The barrier function of stratum corneum –the rate limiting membrane for skin permeation, depends upon the quality and quantity of its constituent lipids and a decrease in their concentration affects its barrier properties. In general, barrier disruption is followed by quick recovery responses. In the metabolic approach, permeation rate is enhanced by delaying this natural recovery processes by application of chemicals/drugs that interfere with the skin metabolism. However, to use this strategy, one has to have a clear understanding of the constituents of the skin as well as the mechanism of Skin homeostasis. The present article discusses some important aspects related to it. 1) the liquid crystalline nature of stratum corneum (the cholesterol and ceramides) 2) the biophysical aspects of the barrier lipids, 3) the sequence of events at stratum granulosum-stratum corneum interface, 4) role of different enzymes/ drugs (HMGCoA Reductase inhibitors) that interfere with barrier recovery and thereby enhance permeation rate of drugs. Important research on this aspect is also analyzed along with the advantages and limitations of the strategy.