

Flavonoid Phloretin: Dermatological Applications

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DESCRIPTION

Botanical molecules are known to have the ability to counteract ultraviolet radiation-induced skin damage. The interest in the development of natural compound-based products for the prevention of solar ultraviolet radiation-induced skin photoaging, melasma, and photocarcinogenesis has been increasing. Recently, the flavonoid phloretin has attracted the attention of researchers in the dermatological field for application in cosmetics and therapeutics. In addition to its antioxidant activity, phloretin has been shown to have properties such as anti-aging and depigmenting effects. In this study, we review the dermatological treatments with phloretin for conditions such as melasma, photoaging, acne, and melanoma.

Phloretin has been shown to inhibit elastase and matrix metalloproteinase-1 activity, to reduce cellular tyrosinase activity

and melanin content, and induce apoptosis in B16 mouse melanoma 4A5 cells. An *in vivo* study showed that phloretin, applied topically to the dorsal skin of mice, suppressed the 12-O-tetradecanoylphorbol 13-acetate-induced expression of COX-2, a critical molecular target of many chemopreventive, as well as anti-inflammatory agents. Phloretin can penetrate the skin; nevertheless, its penetration profile in different skin layers has not yet been evaluated.

Despite its health benefits, phloretin application has been limited because of its photoinstability and poor aqueous solubility, among other limitations. Therefore, we reviewed the recent advances in pharmaceutical applications such as the use of nanotechnology, in order to improve the cutaneous availability of phloretin. In this review, we also focus on the oral application, product development challenges, and recent progress and future research directions on phloretin.

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