DEUTSCHE GESELLSCHAFT FÜR WISSENSCHAFTLICHE UND ANGEWANDTE KOSMETIK E.V.

Gegr. 1957 DGK

In vivo and in vitro SPF determination - two sides of the same coin?

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IFSCC Magazine (2012), 15(2), 97-103

For the purpose of evaluating the risk for consumers who apply less sunscreen than the std. test application amt., the DGK Task Force - "Sun Protection" initiated a multicenter study in accordance with the in vivo test protocol of the International Sun Protection Factor (SPF) Test Method. Three different amts. (0.5, 1.0 and 2.0 mg/cm^2) of three com. sunscreens were investigated in three test centers. The main result obtained was a linear dependence of the SPF on the quantity applied. The recommendation to use an application quantity of 2.0 mg/cm^2 is clearly driven by the aim to produce reliable and reproducible in vivo results. In the subsequent in vitro multicenter study, possible methodologies and strategies for improved accuracy of the detn. of the SPF on sandblasted PMMA plates were compared. Influencing factors such as the amt. of product applied, pretreatment of the samples, equilibration time and temp., and the quality of the spectrophotometer were taken into account. An overall decrease in the std. deviations within single labs. could be achieved for in vitro SPF testing but no improvement in the span of interlab. differences was obtained. The complete findings obtained from this multicenter study could perhaps serve as a solid basis for increasing the reliability of a future in vitro SPF method.