

Nanoparticulate novel sunscreen creams: Development and evaluation

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The objective of the present work was to develop nanoparticulate sunscreen creams containing nanoparticles of a polyphenol along with classical sunscreen agents. Optimized nanoparticles exhibited desirable particle size, zeta potential and entrapment efficiency. FTIR and DSC studies revealed no interaction between polyphenol and excipients used. Transmission electron microscopy, scanning electron microscopy and atomic force microscopy revealed that the nanoparticles were spherical in shape. Optimized polyphenol nanoparticles showed excellent *in vitro* free radical scavenging activity. Nanoparticles did not exhibit cytotoxicity as indicated in MTT assay carried out using Vero and HaCaT cell lines. Skin permeation and skin deposition of morin from its nanoparticles was higher than from its plain form. Different sunscreen creams were formulated by incorporating nanoparticles along with zinc oxide and titanium dioxide in the cream base. Optimized creams showed excellent SPF values as determined by UV-2000S (Labsphere, USA). In *in vitro* skin permeation studies, skin permeation of polyphenol was considerably reduced and its skin deposition was substantially increased. *In vivo* skin permeation studies in rats indicated no transdermal permeation of polyphenol across the skin and excellent retention of polyphenol within the skin. Optimized sunscreen creams indicated excellent dermal safety. Optimized cream demonstrated exceptional *in vivo* antioxidant effect (estimation of catalase, superoxide dismutase, glutathione) in UV radiation exposed rats. The optimized sunscreen cream successfully demonstrated outstanding UV radiation protection as well as antioxidant properties.

Biography

Srinivas Mutalik has completed his PhD in 2004 from Manipal University and postdoctoral studies from University of Queensland, Australia. He is working as an Associate Professor in Manipal College of Pharmaceutical Sciences, Manipal University, India. He has good professional experience in academics and pharmaceutical industry at different capacities. Mutalik has published more than 60 papers in reputed journals and has 4 patents. He has presented papers at various national and international conferences and delivered guest lectures. He has received several research grants from various funding agencies. His research interests include development and evaluation of novel drug delivery systems.

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