

DNA photoprotection conveyed by sunscreen

Charlene DeHaven, MD,¹ Patrick J Hayden, PhD,² Alexander Armento, MS,² & Jonathan Oldach, BS²

¹Innovative Skincare, Burbank, California, USA

²MatTek Corp., Ashland, Massachusetts, USA

Summary

Introduction Skin photoaging is the consequence of solar UV exposure, and DNA damage is an important part of this process. The objective of the current work was to demonstrate that in vitro skin models can be utilized to confirm that DNA damage protection is provided by sunscreens.

Methods Skin equivalents were exposed to full-spectrum UV light administered with a standard research solar simulator with and without pre-application of sunscreen. Cyclopyrimidine dimer (CPD) and sunburn cell (SBC) formation as well as CPD quantitation were evaluated to determine DNA damage protection provided by the sunscreen.

Results Marked decreases in both CPDs and SBCs were observed when sunscreen was applied prior to UV exposure.

Conclusions Sunscreen application prior to full-spectrum solar UV exposure protects DNA from photodamage measured by CPD and SBC formation. This can be expected to lessen the risk of photoaging and malignant transformation.

Keywords sunscreens, DNA damage, apoptosis, cyclopyrimidine dimer, sunburn cell, photoaging
