

# EFFICACY OF SPF70 SUNSCREEN TO PROTECT SKIN AGAINST VISIBLE LIGHT AND AIR POLLUTION

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## INTRODUCTION

Sunscreens are known to protect from sun damage mainly caused by UVA and UVB lights, besides that the effects of visible light (VL) have been extensively investigated and correlated with skin pigmentation<sup>(1)</sup>.

Also, chronical exposition to pollution, mainly particulate matter (PM), contribute to the photoaging and skin pigmentation being a possible emerging etiologic agent for the development of melasma<sup>(2)</sup>.

Considering that, the development of dermo-cosmetic able to protect skin form VL and PM are essential to maintaining skin health.

## OBJECTIVE

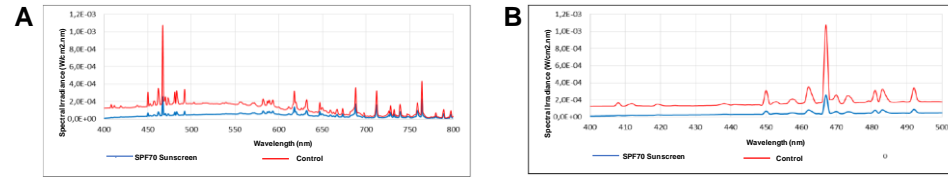
The aim of this study was to evaluate the efficacy of a facial sunscreen SPF 70 formulation containing Vitamin C derivative, carnosine, melanin analogue, iron oxides and AHR antagonist to protect skin cells against VL and PM damage for the improvement of photodamage and to prevent hyperpigmentation.

## METHODS

*In vitro* and *ex vivo* studies was conducted to evaluate the impact of PM and VL on keratinocytes viability and melanin production.

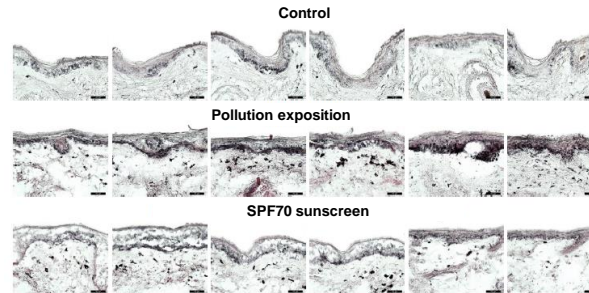
## RESULTS

The SPF 70 sunscreen containing vitamin C, carnosine, melanin analogue, iron oxides and AHR antagonist presented VL protection with a transmission of visible light spectrum reduction by 66.4%. The formula presented also 78.5% spectrum reduction of blue light (Fig.1). These results demonstrated that the SPF70 Sunscreen presented a good VL protection and should be able to protect the skin against pigmentation, metalloproteinases synthesis and collagen degradation<sup>(3)</sup>.



**Fig. 1:** Average spectra of spectral irradiance emitted through the blank plate and the applied product plates, for VL (A) and blue light (B) irradiations.

*Ex vivo* studies results showed that the pollution had a negative impact on keratinocytes viability and increases melanin syntheses by 93% compared with control non treated group. However, the FPS70 protective formula showed a protective effect increasing cells viability by 66%, and decreased melanin stimuli by 39% (Fig.2). These results evidenced the SPF70 sunscreen protection against PM damage to skin.



**Fig.2:** Representative images of the whitening evaluation in fragments of human skin treated with SPF70 Sunscreen compared to the control group, and later stained using the Fontana-Masson technique.

## CONCLUSION

These results increased the knowledge about the impact of VL and pollution to the skin and showed that the SPF70 sunscreen formulation containing Vitamin C derivative, Carnosine, Melanin Analogue, Iron oxides and AHR antagonist was able to protect cells against external aggressors by acting as a true protective shield against VL and pollution.

**REFERENCES:** 1. Regazzetti C., et al. Melanocytes Sense Blue Light and Regulate Pigmentation through Opsin-3. *J Invest Dermatol.* 2018 Jan;138(1):171-178. 2 Puri P., et al. Effects of air pollution on the skin: A review. *Indian J Dermatol Venereol Leprol.* 2017 Jul-Aug;83(4):415-423. 3. Boukari F, et al. Prevention of melasma relapses with sunscreen combining protection against UV and short wavelengths of visible light: a prospective randomized comparative trial. *J Am Acad Dermatol* 2015;72:189-90. 4. Hüls A, et al. Traffic-Related Air Pollution Contributes to Development of Facial Lentiginos: Further Epidemiological Evidence from Caucasians and Asians. *J Invest Dermatol.* 2016 May;136(5):1053-1056.