

# How to substantiate anti-ageing claims: An in vivo method for anti-oxidant effects

Pedro Contreiras Pinto<sup>1</sup>, Joana Pereira<sup>2</sup>, Ana Gomes<sup>2</sup>, Manuel Fitas<sup>1</sup>

<sup>1</sup>PhD Trials R&D Department, Lisbon, Portugal

<sup>2</sup>PhD Trials Technical Department, Lisbon, Portugal  
Email: gerald@phdtrials.com



**in-cosmetics Global  
stand J138**

## INTRODUCTION

Skin Aging is a complex biologic process due to genetic background influence and environmental factors. UV radiation is one of the major factors that induce photo damage in the skin due to the production of reactive oxygen species (ROS). In skin, these ROS are responsible for inducing skin ageing effects, like skin thickness, dryness, hyperpigmentation and wrinkles.

The present work shows an in vivo non-invasive method that can be able to demonstrate anti-oxidant effects on the human skin and complement the analysis of the skin's structural and photo-induced modifications detected by Confocal Microscopy, High Resolution and 3D fringe projection Images.

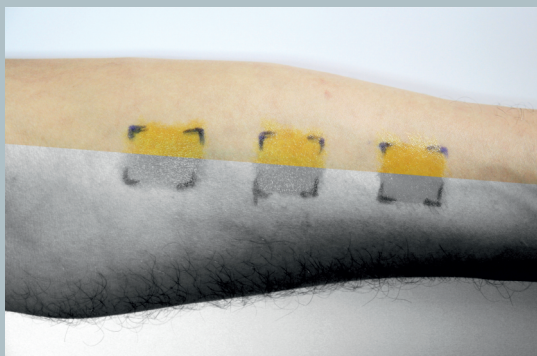


Figure 1A: image of anti-oxidante protocol

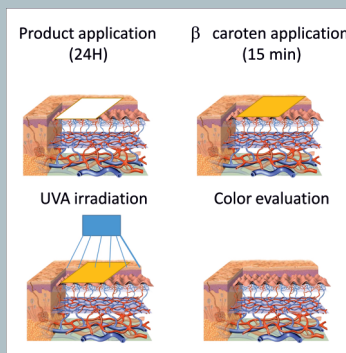


Figure 1B: Protocol definition for the *in vivo* study

## METHODOLOGY

The anti-oxidant method uses the  $\beta$ -carotene that is a Yellow chromophore molecule and when is oxidized by UV radiation it loses its chromophore capability and color. This discoloration can be monitored by colorimetry ( $b^*$  parameter).

The structural changes were assessed using three different methods: a Reflectance Confocal Microscopy (RCM) was performed in order to see structural changes related to aging process, at the same time a standard digital face photography (VISIA, Canfield Scientific) and an image by fringe projection (AEVA-HE, Eotech) were also performed in order to obtain data concerning Visible, Brown (hyperpigmentation), U.V. (photodamaged induced spots) and skin topography.

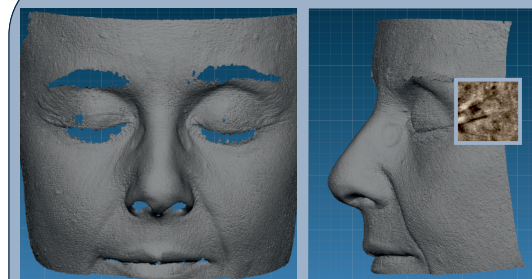


Figure 2: skin topography images by AEVA-HE

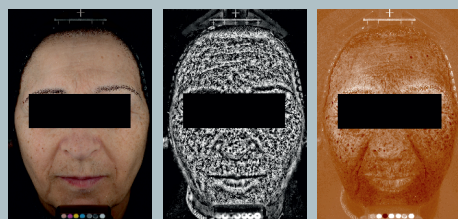


Figure 2: Visible, UV and brown spot images

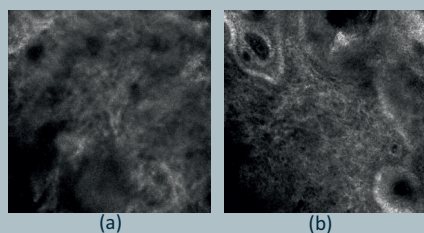


Figure 3: confocal structural images of fiber network (a) and dermal papillae (b)

## CONCLUSION

This techniques allows to measure oxidative stress on skin, on an in vivo non-invasive way, and therefore it can be useful on the assessment of skin ageing, particularly on the evaluation of the effectiveness against photoaging effects such as melanin distribution, vascular changes and structural changes on fibers network.

Come and visit our booth **J138** to see all the anti-ageing study options.

## REFERENCES

- [1] Polefka, T.G., Meyer T.A., Agin, P.P, Bianchini R.J.. J Cosmet Dermatol, 11(2), 134-43 (2012)
- [2] Ratz-Lyko, A., Arct, J., Pytkowska, K. Skin Research and Technology, 18, 421-430 (2012)
- [3] Ziosi, P., Besco, E., Vertuani, S., Solaroli, N., Manfredini, S. Skin Research and Technology 12, , 303-308 (2006)
- [4] Tundis, R., Loizzo, M.R., Bonesi, M., Menichini, F. Curr Med Chem 22, , 1515-38 (2015)
- [5] Cula, G.O., Bargo, P.R., Nkeghe A., Kolias, N., Skin Research and Technology, 19(1), 243-251 (2013)