Poster ID – **P1017**

Dual-Action Antioxidant Serum for Ultraviolet-Induced Skin Protection Compared with Placebo

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Introduction & Objectives

Background: Ultraviolet (UV) radiation is a major contributor to oxidative stress and epidermal barrier disruption in human skin. This study investigates the unique efficacy of antioxidant formulation with Vitamin C, Feverfew, and Epigallocatechin gallate (collectively: AOX2.0) in mitigating UV-stress-induced lipid peroxidation and preserving epidermal integrity, using a vehicle formulation as control.

Objectives: To investigate the extended antioxidant effects of topical 15% vitamin C, feverfew, and epigallocatechin gallate (AOX 2.0) serum application against UV irradiation in 2D skin cells and 3D skin models.

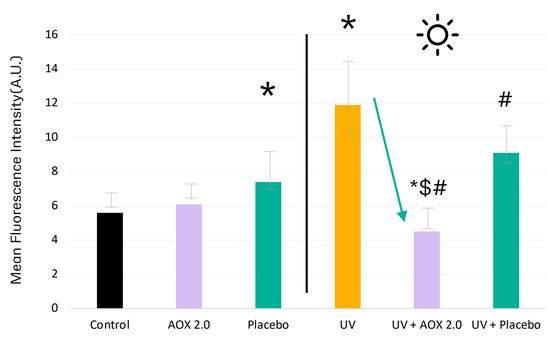
To assess the impact of topical application of AOX 2.0 on collagen expression and oxidative stress in UV-irradiated human skin explants by immunohistochemical analysis of collagen types I, III, IV, elastin, and 8-OHdG (DNA oxidation marker).

Materials & Methods

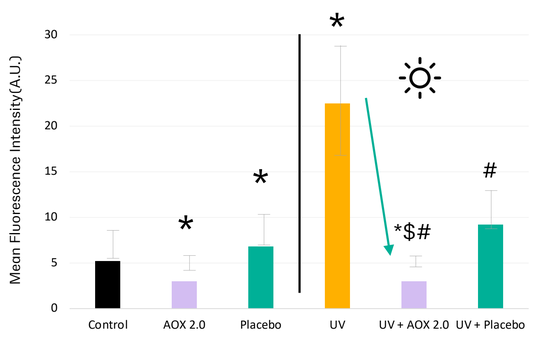
Keratinocytes, fibroblasts, 3D reconstructed human epidermis, and *ex vivo* human skin explants were pretreated with AOX2.0 or vehicle and subjected to UV irradiation. Lipid peroxidation was assessed using BODIPY™ 581/591 C11 fluorescence and 4-hydroxynonenal (4-HNE) protein adduct quantification. Epidermal barrier integrity was evaluated through transepithelial electrical resistance (TEER) and immunofluorescence analysis of filaggrin expression.

Results- AOX 2.0 serum protects against Lipid Peroxidation vs Placebo Control in *In vitro* and *Ex Vivo* Models

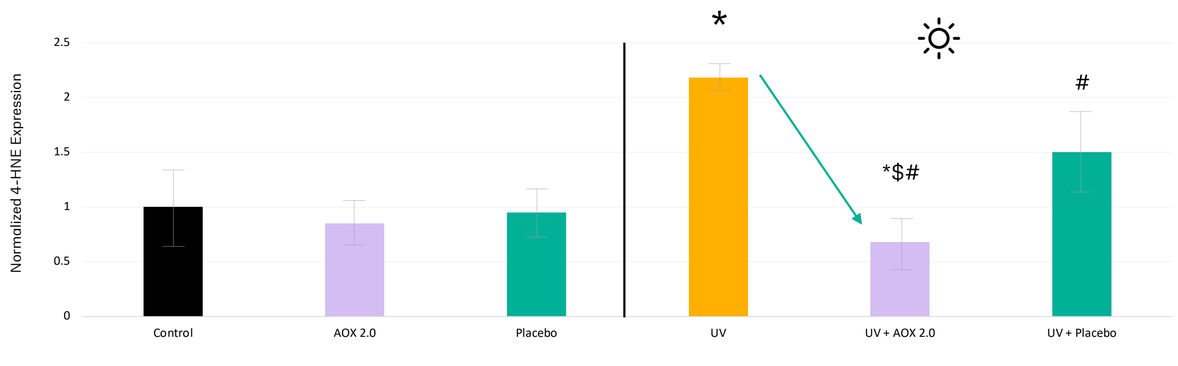
AOX 2.0 serum attenuated UV-stress-induced lipid oxidation in human keratinocytes



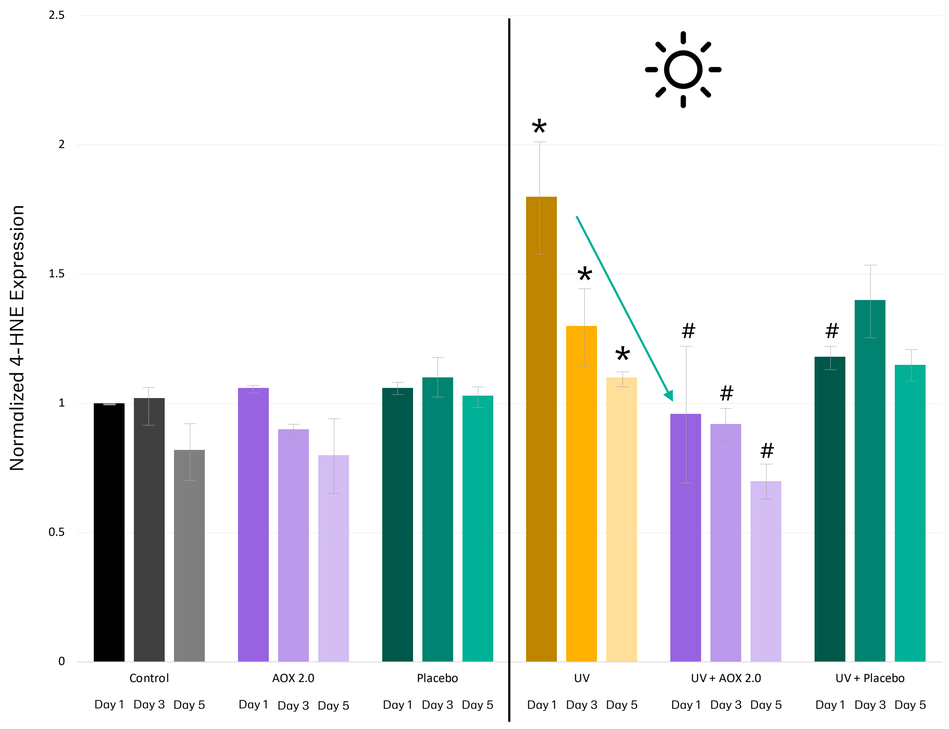
AOX 2.0 serum reduced lipid oxidation endogenously and under UV-stress fibroblasts



Lipid oxidation was significantly reduced by AOX 2.0 serum under UV-stress-induced oxidative stress in 3D reconstructed human epidermis



Lipid oxidation was significantly reduced by AOX 2.0 serum with continuous reduction of lipid oxidation across day 1, 3, and 5 with the largest reduction on day 5 in 3D Skin Explants

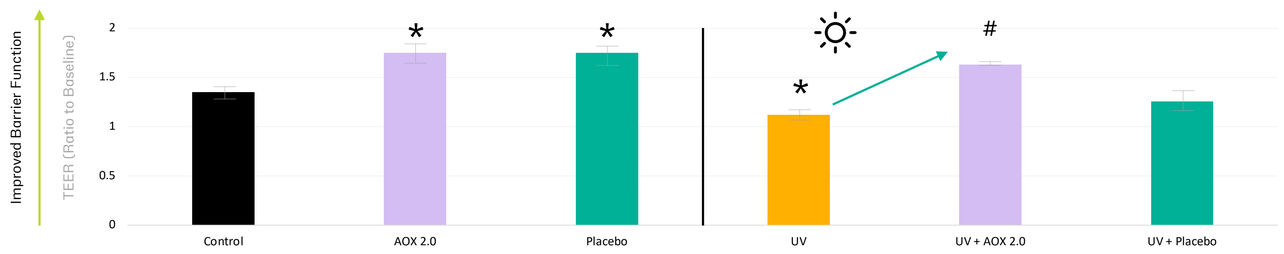


Statistical Analysis Key Code:

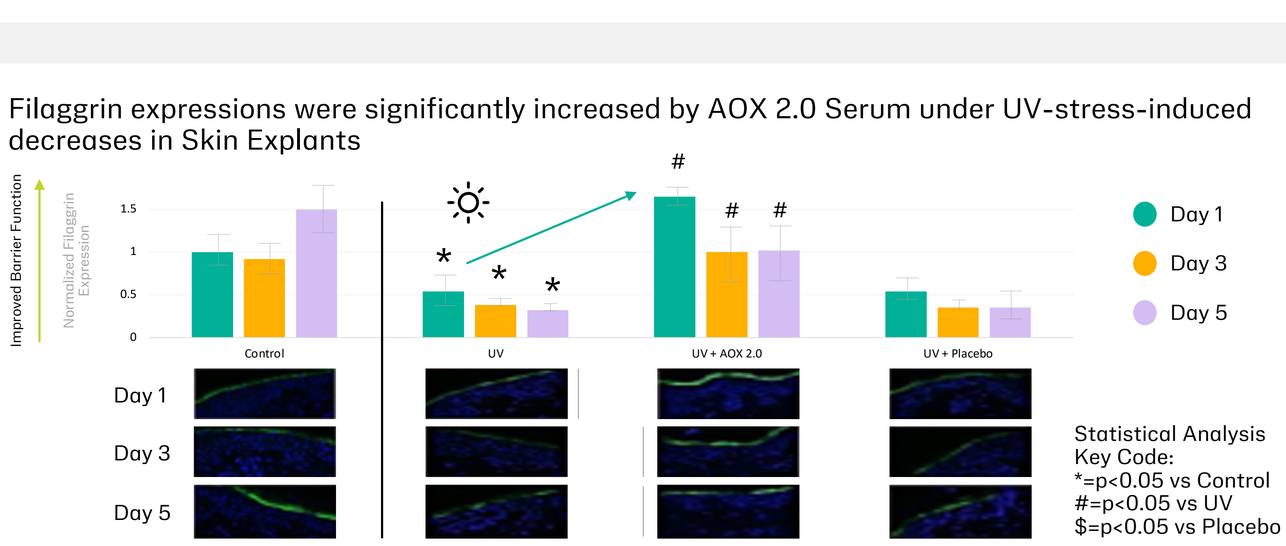
*=p<0.05 vs Control | #=p<0.05 vs UV | $=p<0.05 vs Placebo

Results-AOX 2.0 serum improved skin barrier function and filaggrin expression vs placebo control while also protecting collagen I, III, IV, elastin and reducing 8-OHdG under UV-stress-induced damage in 3D reconstructed human epidermis or *ex vivo* skin explants

Skin Barrier was improved by AOX 2.0 serum under UV-stress-induced TEER decrease in 3D reconstructed human epidermis

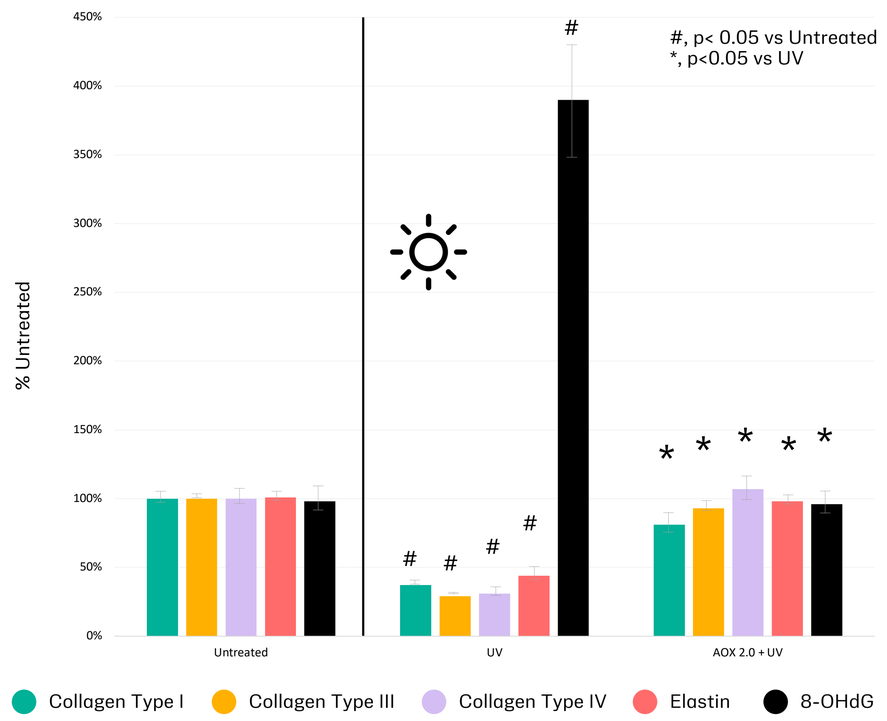


Filaggrin expressions were significantly increased by AOX 2.0 Serum under UV-stress-induced decreases in Skin Explants



Statistical Analysis Key Code:
*=p<0.05 vs Control
#=p<0.05 vs UV
$=p<0.05 vs Placebo

AOX 2.0 serum protected Collagen type I, III, IV, Elastin and reduced 8-OHdG under UV-stress-induced Damage in 3D Skin Explants



Results and Conclusion

AOX 2.0 serum demonstrated robust and consistent antioxidant protection across 2D cell lines, 3D RHE, and *ex vivo* human skin explants, as observed by:

- Significantly reduced UV-induced lipid peroxidation in keratinocytes, fibroblasts, and tissue models, outperforming placebo at all measured timepoints and conditions.
- Dual benefits of reduction in oxidative stress and improved skin barrier function, as shown by increased TEER values and enhanced filaggrin expression following UV exposure.
- Protection of collagen type I, III, IV, elastin, and reduced 8-OHdG under UV-stress-induced damage in *ex vivo* skin explants.

These results suggest that AOX 2.0 serum may offer protection against UV-stress-induced oxidative damage and support both epidermal and dermal recovery.

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