

# Scientific Study

Topically Applied  
Polyphenolic Antioxidants  
Reverse Facial Photoaging

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Presented at the  
American Academy of Dermatology (AAD) 67<sup>th</sup> Annual Meeting  
San Francisco, California, USA  
March 2009

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# TOPICALLY APPLIED POLYPHENOLIC ANTIOXIDANTS REVERSE FACIAL PHOTOAGING

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## INTRODUCTION

In the skin, ultraviolet radiation and environmental exposure result in photoaging with loss of collagen, decreases dermal thickness and a compromised epidermal barrier. It has been postulated that topical antioxidants can improve skin barrier properties and regenerate important enzyme systems. The purpose of this study was to determine whether topical antioxidant application could reverse changes associated with photoaging.

## MATERIALS & METHODS

- 10 Female Volunteers; Skin Phototypes I - IV
- Ages 38 – 52 (Average 42)

## TREATMENT PROTOCOL

- Full Facial Microdermabrasion Performed
- Polyphenolic Antioxidant Serum Applied Pneumatically to Left Side of Face
- 6 Treatments Performed at 7-10 Day Intervals
- Retinols and Hydroxy Acids Avoided During Study Period

## CLINICAL DOCUMENTATION

- Digital Photographs Taken at Beginning of Study and 2 Weeks Following Last Treatment
- Independent Clinician Ratings for Efficacy Variables Analyzed After Study and Compared to Baseline

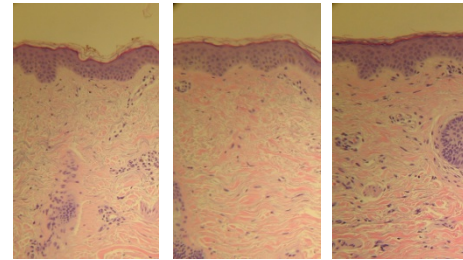
## TISSUE DOCUMENTATION

- Full Thickness Skin Biopsies Obtained at Beginning of Study (Control) and 2 Weeks Following Last Treatment – Left side (HDA); Right side (MDA)
- Raman Scattering Spectroscopy Performed at Beginning of Study (Control) and 2 Weeks Following Last Treatment – Left side (HDA); Right side (MDA)

## EQUIPMENT USED

- HydraFacial™ Tower System (Edge Systems, Signal Hill, California)
- Antiox 6 Serum™ (Edge Systems, Signal Hill, California)
- Pharmanex BioPhotonic Scanner (Pharmanex, Provo, Utah)

## HISTOLOGICAL RESULTS



In the antioxidant treated tissue (HDA) there was:

- Increased Basal Layer Activity
- Collagen Hyalinization in Dermis
- Increased Fibroblast Population

CONTROL MDA HDA

N=10	Control	MDA	HDA
Epidermal thickness (microns)	49 ± 7	65 ± 9 *	80 ± 8 †
Papillary dermal thickness (microns)	285 ± 20	354 ± 21 *	418 ± 25 †
Fibroblast Density (per high powered field)	3.9 ± 0.3	5.8 ± 0.4 *	8.0 ± 0.5 †
Skin Polyphenolic Antioxidant Level (Raman Intensity Units)	15,700 ± 3000	16,500 ± 4000	24,000 ± 4,500

\* p<.01 vs Control † P<.01 vs MDA

## CLINICAL RESULTS

Efficacy variables that measured changes in fine lines, pore size, skin texture, dullness and hyperpigmentation showed significantly greater improvement from mean baseline in the polyphenolic antioxidant treated group (HDA)

## CONCLUSION

The pneumatic application of polyphenolic antioxidants to facial skin resulted in clinical and histological changes consistent with reversal of photoaging. The increased levels of polyphenolic antioxidants in the skin correlated with increases in collagen deposition, fibroblast density and papillary dermal hyalinization. These findings indicate that pneumatically applied antioxidants are effective in skin rejuvenation.