Astrion™

Skin rejuvenation and hydration through enhanced endogenous production of collagen & hyaluronic acid

Water soluble for topical and oral applications

---

12 *in-vitro* and 1 human clinical trial

Patents:
US 7,959,952
TW I362936
CN 2007 10095863

Pennies per serving

nulivscience.com

ASTRION™ REDUCES WRINKLES AND SKIN DISCOLORATION

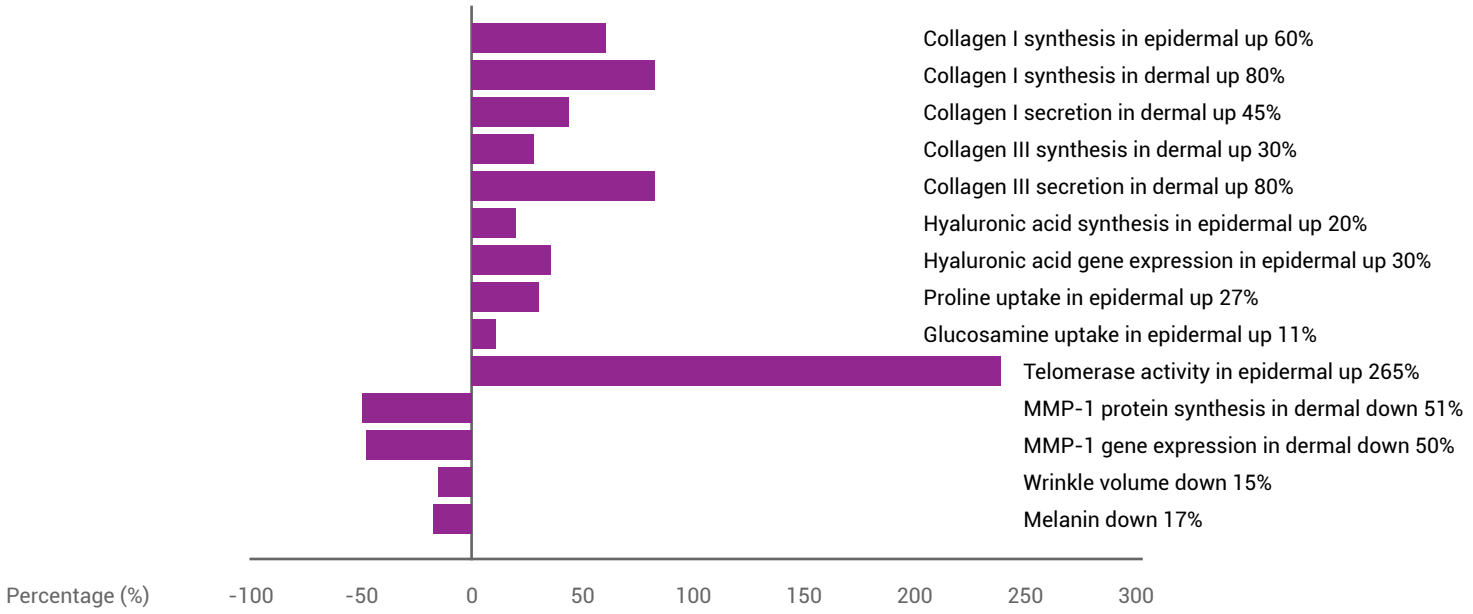
Astrion™ is NuLiv Science's clinically studied cosmeceutical composed of highly purified and fractionated extracts from *Astragalus membranaceus* and *Centella asiatica* produced by a proprietary extraction method.

Astrion™ reduces the number and appearance of fine lines and wrinkles through increased endogenous production of collagen and hyaluronic acid as well as increased absorption of proline and glucosamine (the building blocks of collagen and hyaluronic acid, respectively) in skin cells, Astrion™ also reduces the breakdown of collagen in skin cells and skin discoloration due to UV light damage from the sun. Specifically, Astrion™ has shown in 12 *in-vitro* and one human study to:

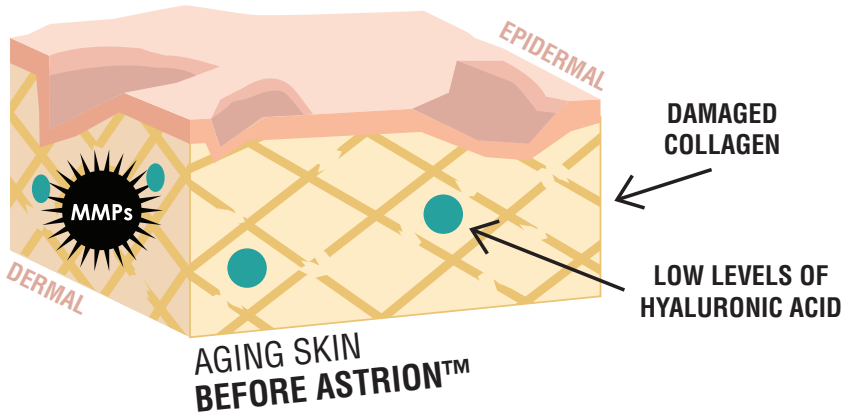
- increase collagen I synthesis in epidermal cells (HaCaT cell) by 60%
- increase collagen I synthesis in dermal cells (HDF cell) by 80%
- increase collagen I secretion in dermal cells (HDF cell) by 45%
- increase collagen III synthesis in dermal cells (HDF cell) by 30%
- increase collagen III secretion in dermal cells (HDF cell) by 80%
- increase hyaluronic acid synthesis in epidermal cells (HaCaT cell) by 20%
- increase the hyaluronic acid synthase (HA Synthase 2) gene expression in epidermal cells (HaCaT cell) by 30%
- increase proline uptake in epidermal cells (HaCaT cell) by 27%
- increase glucosamine uptake in epidermal cells (HaCaT cell) by 11%
- increase telomerase activity in epidermal cells (HaCaT cell) by 265%
- decrease MMP-1 protein synthesis in dermal cells (HDF cell) by 51%
- decrease MMP-1 gene expression in dermal cells (HDF cell) by 50%
- reduce wrinkles by 15% (human study)
- reduces melanin by 17% for lightening up the skin (human study)

For details, please see "View Scientific Papers"

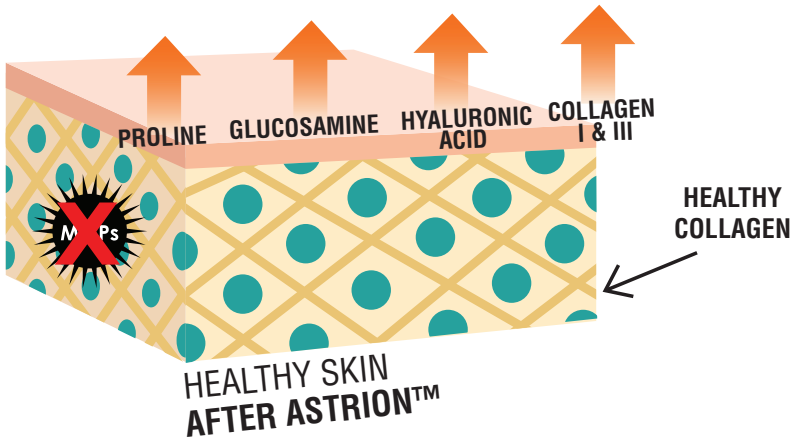
NULIV IN-VITRO AND HUMAN STUDIES



HOW ASTRION™ WORKS

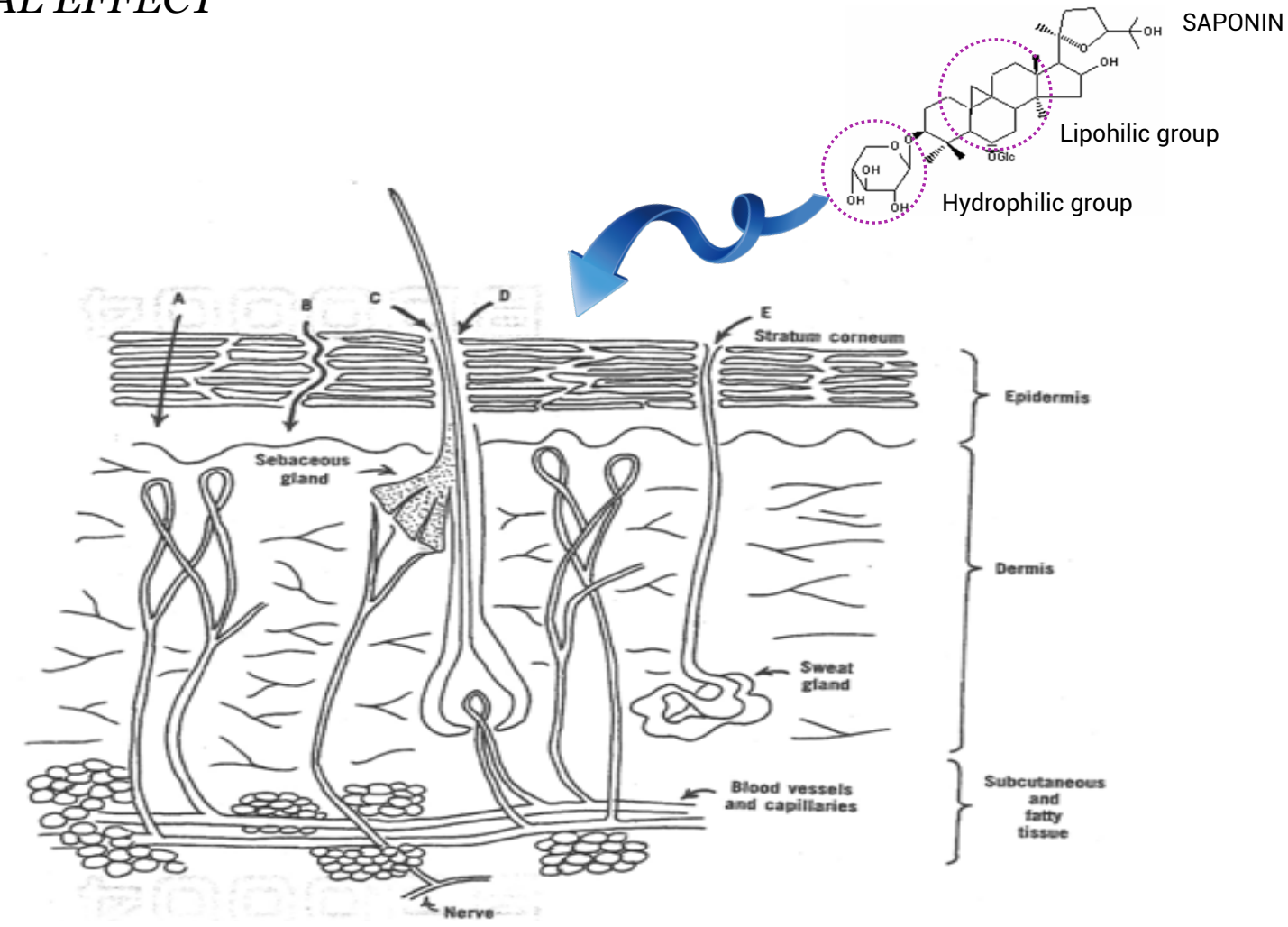


Wrinkle, aged, dehydrated, and discolored



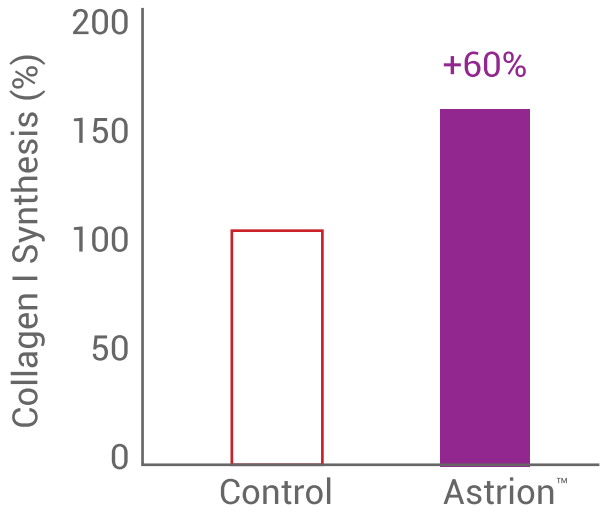
Firms, tones, hydrates

TRANSDERMAL EFFECT



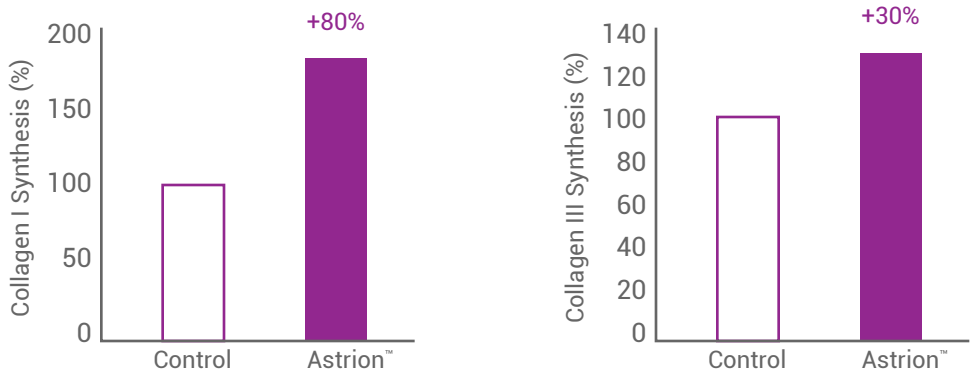
A. transcellular;
B. diffusion through channels between cells;
C. through stratum ducts;
D. through transfollicular;
E. through sweat ducts

ASTRION™ INCREASES COLLAGEN I SYNTHESIS IN (HaCaT) CELLS



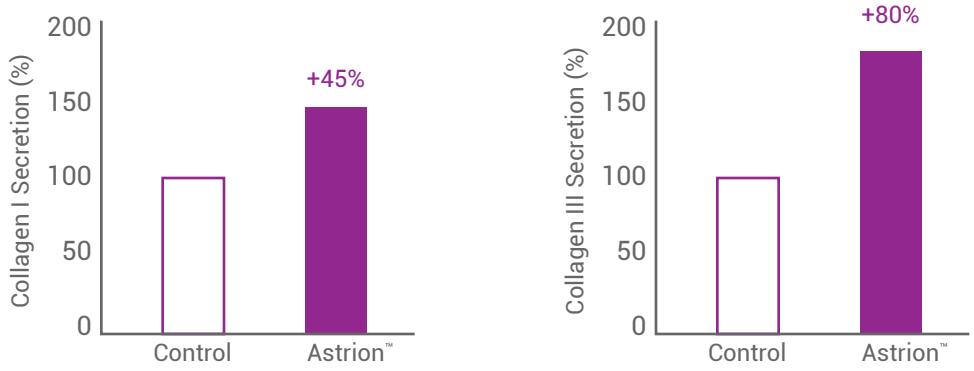
Human epidermal (HaCaT) cells were treated with or without Astrion™ for 24h before harvested for analysis of Collagen I expressed in cell extract, Quantitated data from Western Blot Analysis showed that Astrion™ increased collagen I synthesis in epidermal cells (HaCaT cell) by 60%.

ASTRION™ INCREASES COLLAGEN I & COLLAGEN III SYNTHESIS IN DERMAL (HDF) CELLS



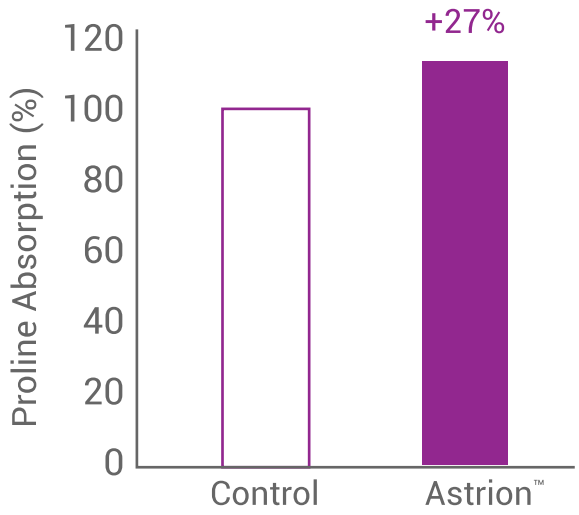
Human dermal fibroblasts cells (HDF) were treated with or without Astrion™ for 24h before harvested for analysis of Collagen I and Collagen III expressed in cell extract. Quantitated data from Western Blot Analysis showed that Astrion™ increased Collagen I and Collagen III synthesis in dermal (HDF) cells by 80% and 30%, respectively.

ASTRION™ INCREASES COLLAGEN I & COLLAGEN III SECRETION IN DERMAL (HDF) CELLS



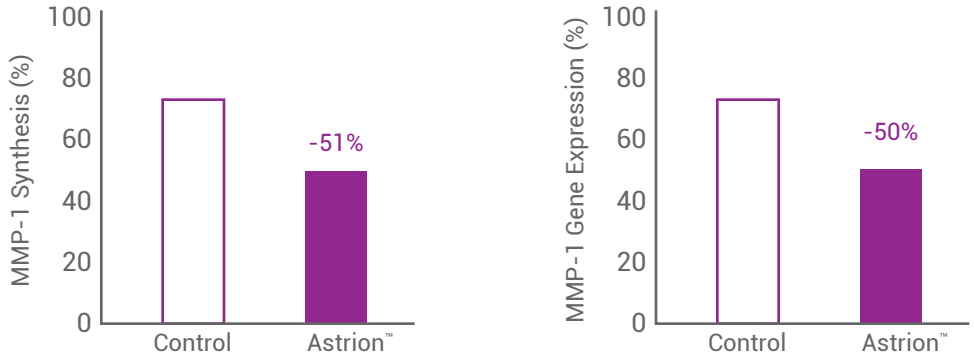
Human dermal fibroblasts cells (HDF) were treated with or without Astrion™ for 24h before harvested for analysis of Collagen I and Collagen III secreted into the culture medium. Quantitated data from Western Blot Analysis showed that Astrion™ increased Collagen I and Collagen III secretion in dermal (HDF) cells by 45% and 80% respectively.

ASTRION™ INCREASES PROLINE ABSORPTION (BUILDING BLOCKS OF COLLAGEN) IN EPIDERMAL (HaCaT) CELLS



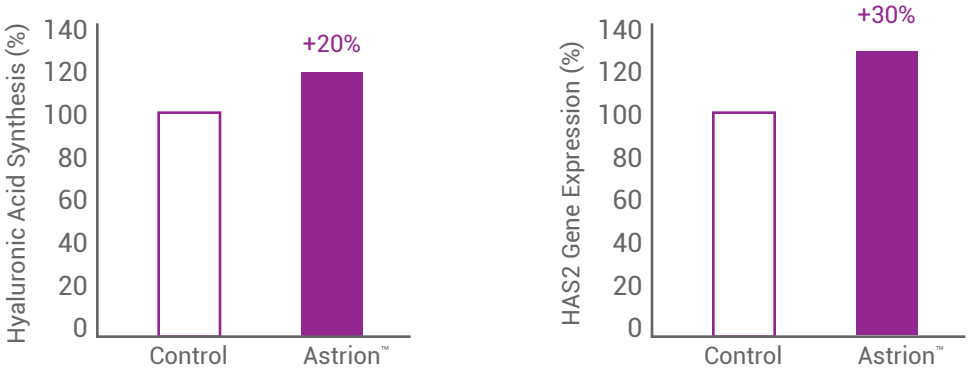
Human epidermal (HaCaT) cells were treated with or without Astrion™ for 48h. The treated cells were then washed once with PBS and incubated in amino acid-free medium for another 30 minutes. The treated cells were then replaced with fresh amino acid-free medium containing ^{3}H proline. After designated time intervals, the cells were lysed then centrifuged. Intracellular proline uptake by the cells was determined by microplate liquid scintillation counter. The amount of proline accumulated in the cells was calculated and normalized to protein concentration. The study showed that Astrion™ increased proline absorption in epidermal (HaCaT) cells by 27%.

ASTRION™ DECREASES MATRIX METALLOPROTEINASE-1 (MMP-1) SYNTHESIS & GENE EXPRESSION IN DERMAL (HDF) CELLS



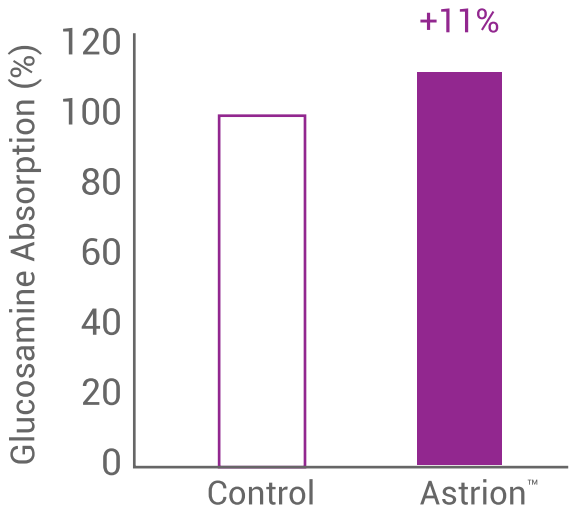
To characterize the effects of Astrion™ on the gene and protein level of MMPs, human dermal fibroblasts (HDF) cells were first treated with or without Astrion™ solution for 24h. The cells were washed with PBS and irradiated with 50 mJ/cm^2 of UV-B (312nm) for HDF cells, using the UV light irradiator. The cells were then washed and incubated with a serum-free medium for 24h before harvested for analysis. Quantitated data from Western Blot Analysis showed that Astrion™ decreased MMP-1 synthesis in HDF cells by 51%. Relative MMP-1 gene expression in HDF cells were determined by quantitative reverse transcripton PCR (qRT-PCR). The result showed that Astrion™ decreased MMP-1 gene expression in HDF cells by 50%.

ASTRION™ INCREASES HYALURONIC ACID SYNTHESIS & HYALURONIC ACID SYNTHASE 2 (HAS2) GENE EXPRESSION IN EPIDERMAL (HaCaT) CELLS



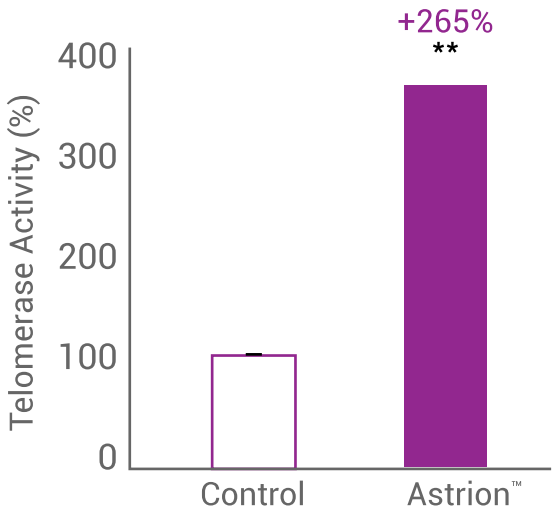
Human epidermal (HaCaT) cells were treated with or without Astrion™ solution for 48h. At the indicated time, aliquots of medium were removed, centrifuged, and supernatants were analyzed for Hyaluronic acid using an enzyme-linked immunosorbent assay (ELISA) kit. Astrion™ was shown to increase Hyaluronic acid synthesis in HaCaT cells by 20%. Relative hyaluronic acid synthase 2 gene expression in HaCaT cells were determined by quantitative reverse transcription PCR (qRT-PCR), Astrion™ was shown to increase HAS2 gene expression in HaCaT cells by 30%.

ASTRION™ INCREASES GLUCOSAMINE ABSORPTION (BUILDING BLOCKS OF HYALURONIC ACID) IN EPIDERMAL (HaCaT) CELLS



Human epidermal (HaCaT) cells were treated with or without Astrion™ solution for 48h. The treated cells were then washed once with PBS and incubated in glucose and serum-free medium (GSFM) for another 2h. The treated cells were then replaced with fresh GSFM containing ^{3}H glucosamine. After designating time intervals, the cells were lysed then centrifuged. Intracellular glucosamine uptake by the cells was determined by microplate liquid scintillation counter. The amount of glucosamine accumulated in the cells was calculated and normalized to protein concentration. Astrion™ was shown to increase glucosamine absorption in epidermal (HaCaT) by 11%.

ASTRION™ INCREASES TELOMERASE ACTIVITY IN EPIDERMAL (HaCaT) CELLS

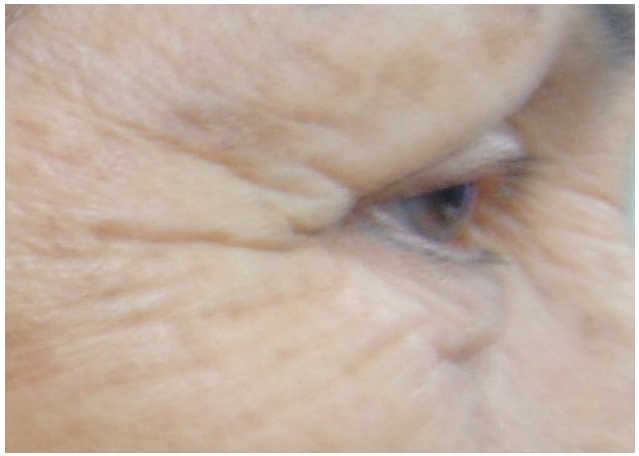


** p<0.01 when compared to the control group

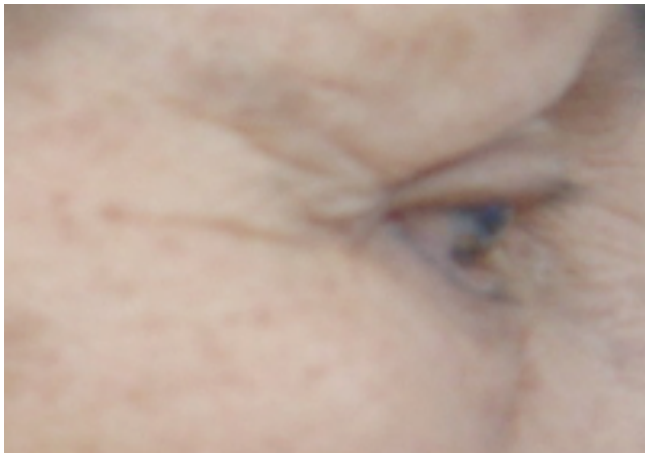
Human epidermal (HaCaT) cells were seeded into 6-well plate for 24h. The cells were treated with or without Astrion™ for another 24h. Telomerase of the samples were measured by TRAPEZE RT Telomerase Detection Kit according to the manufacturer's protocol. Astrion™ was shown to increase telomerase activity in epidermal (HaCaT) cells by 265%.

HUMAN STUDY

Duration: 4 weeks
Subjects: Age from 38-82 years
Male: 6, average age 50.67 years
Female: 13, average age: 58.77 years
Average age all of participants: 56.21 years
Result: Wrinkle reduced by 14.8%, melanin reduced by 16.6%

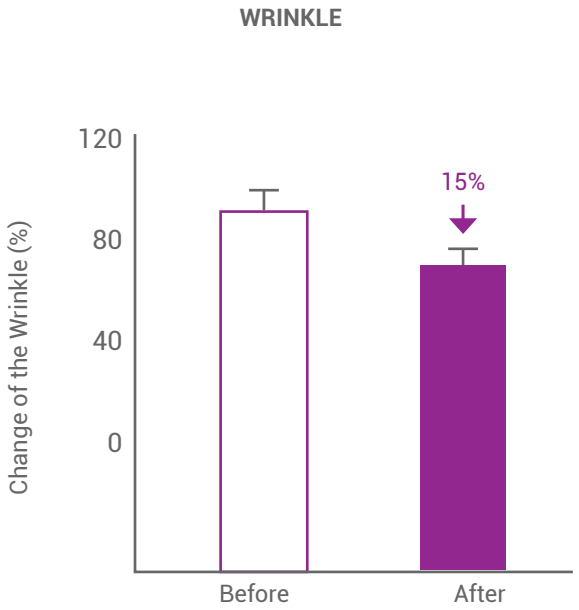


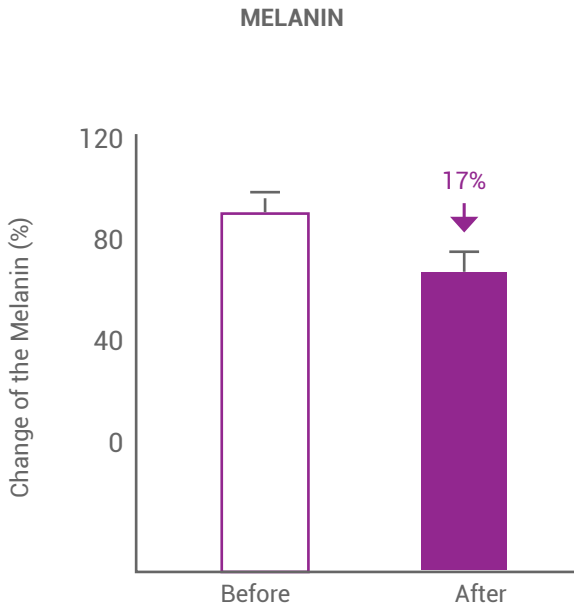
BEFORE



AFTER

HUMAN STUDY


WRINKLE
120
80
40
0
Change of the Wrinkle (%)
15%
Before
After


MELANIN
120
80
40
0
Change of the Melanin (%)
17%
Before
After

For questions and additional information please contact

NuLivScience

nulivscience.com