



## YOUTH SERUM™ COLLAGEN SYNTHESIS

### Induction of collagen synthesis *in vitro* in human fibroblasts

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#### STUDY OBJECTIVE

YOUTH SERUM™ was evaluated for its ability to encourage collagen synthesis in aged human fibroblasts.

#### STUDY DESIGN

Fibroblasts with a biologic age of 50+ years were grown in cell culture both with and without exposure to YOUTH SERUM™. Wells containing fibroblasts without YOUTH SERUM™ treatment were used as the Control. The Sircol dye reagent assay with photo-colorimetric quantitation was used to measure collagen synthesis at timed intervals. Measurements from the various tissue culture wells were compared to evaluate the effectiveness of YOUTH SERUM™ in increasing collagen synthesis.

#### SIGNIFICANCE OF STUDY

With both photoaging and intrinsic aging, impairment of collagen synthesis occurs. Collagen is the most abundant human protein and most collagen is found in the skin. The aging process and photoaging in particular demonstrates visible changes related to loss of functional collagen, including wrinkling, sagging, decreased elasticity, and loss of resiliency to stress.

The synthesis of collagen occurs continuously throughout life to repair damaged tissue and build new cellular structures. Collagen synthesis progressively declines about one percent with each year of life and by the age of 60, about one-half of the functional collagen is synthesized compared to the age of 20. Aged fibroblasts both *in vitro* and *in vivo* are able to produce less collagen compared to younger cells. Aged fibroblasts were used for this study to present a stronger test for the product. Fibroblasts are the skin cells responsible for synthesizing collagen.

An increase in collagen synthesis in aged cells is even more significant than in youthful cells since older cells are functionally less able to produce collagen effectively and in amounts able to compensate for ongoing damage processes. Furthermore, popular interest in decreasing the visible signs of aging increases with advancing age, as these signs become more noticeable. Products able to encourage collagen synthesis are desired by persons wishing to minimize the signs of aging and maintain skin health throughout life.

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## RESULTS AND CONCLUSIONS

Older fibroblasts with equivalent age of 50 years were able to increase their collagen synthesis in the presence of YOUTH SERUM™. These results were compared to control values without YOUTH SERUM™ and evaluated for statistical significance. Collagen concentrations are shown in the bar graph on page 2.

Fibroblasts in the presence of YOUTH SERUM™ synthesized much more collagen compared to Control cells without YOUTH SERUM™. These results were statistically significant.

Fibroblasts in the presence of Product 1 were unable to synthesize more collagen than the Control cells without Product 1 when results were evaluated for statistical significance.

Fibroblasts in the presence of Product 2 were unable to synthesize more collagen than the Control cells without Product 2 when results were evaluated for statistical significance.

YOUTH SERUM™ clearly improved the synthesis of collagen by aged fibroblasts. Two other products in the marketplace were unable to improve collagen synthesis. These results have positive implications for using YOUTH SERUM™ to improve changes seen in the aging face associated with wrinkling, sagging, and loss of resiliency.

