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AGELOC YOUTH RESEARCH

PRE-CLINICAL STUDY: EFFECT ON GENE EXPRESSION

The pre-clinical study results below were presented at a scientific conference—Oxygen Club of California at the University of California, Davis in 2016. The study provides further validation of the science behind ageLOC Youth—Nu Skin's most advanced anti-aging supplement developed to deliver a wide range of systemic youth preservation benefits.

Background

The average age of populations around the globe is increasing, with a greater portion of the population living to an advanced age. Hence, strategies to lessen the negative effects of aging, including supplementation, are of great importance.

A unique blend of ingredients in ageLOC Youth was designed to improve "youthspan"—the years someone can enjoy life being more active, energetic, and healthy. Nu Skin scientists evaluated the scientific literature to identify natural ingredients with healthy anti-aging benefits. They then evaluated an array of ingredients using proprietary gene expression research to identify ingredients with the ability to positively modulate gene expression patterns. The purpose of the present study was to investigate whether ageLOC Youth could positively impact gene expression in the brain (cerebral cortex) to mimic that of a known healthy model of aging.

Methods

Mice were equally divided into groups (n=7). The first group—"typical aging"—represented normal aging with no intervention. The second group—"healthy aging"—represented aging subjects that underwent a powerful anti-aging intervention that is known to be effective, but not feasible, in humans. The third group—"ageLOC Youth"—represented typical aging subjects that were fed the ageLOC Youth ingredient blend. All groups were followed during 2-30 months of age, with interventions in the healthy aging and ageLOC Youth groups beginning at 12 months of age.

Gene expression microarrays (gene chips) were used to measure gene expression in the brain in all groups. Statistical analysis was conducted using genomic software to identify changes in gene expression with healthy aging and with ageLOC Youth. Further analysis was done to identify changes in gene expression pathways as well as significant functional changes in gene expression subnetworks.

Results

Comparison of the ageLOC Youth group to the healthy aging group showed that the gene expression patterns of both groups were practically indistinguishable. Thousands of genes were similarly expressed in both groups. The healthy aging and ageLOC Youth groups both had a larger proportion of downregulated genes, whereas the gene expression pattern for typical aging was primarily upregulated.

Analysis of gene expression pathways and subnetworks demonstrated that several changes in gene expression were related to cognition, learning and memory, adult neurogenesis, nervous system function, and metabolic health.

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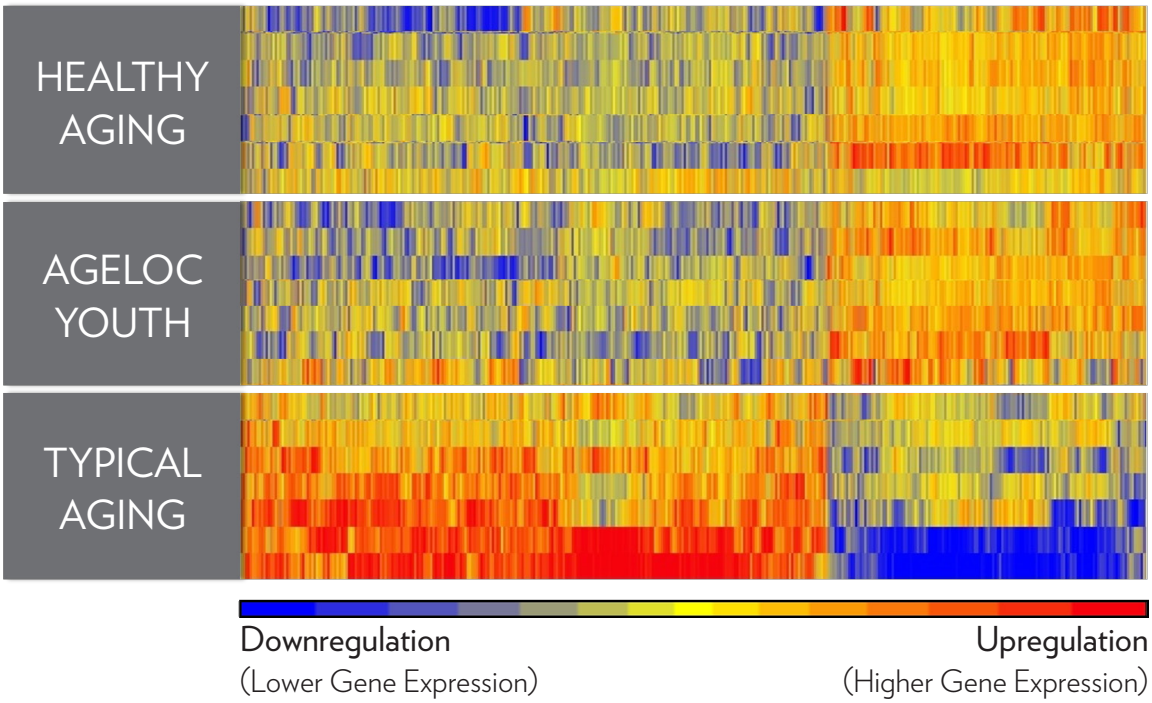
GENE EXPRESSION PATTERNS



Summary

The first major finding of the study was that both healthy aging and ageLOC Youth positively modulated gene expression toward a more youthful profile, indicating that the nutrient blend mimicked healthy aging to a striking degree in the brain.

Second, both healthy aging and ageLOC Youth modified the expression of thousands of genes in the same direction. The fact that the regulation of gene expression was in the same direction with healthy aging as with ageLOC Youth indicates that these two interventions have common mechanisms.

Third, ageLOC Youth modulated subnetworks, gene ontology pathways, and biological pathways in a manner similar to healthy aging. Several of the affected gene expression patterns in the cerebral cortex of the brain were related to cognition, learning and memory, adult neurogenesis, and nervous system function, suggesting functional relevance.

(May 2017)

Reference:

Mastaloudis, A.; Serna, E.; Wood, S.M.; Hester, S.N.; Weindruch, R.; Prolla T.A. and Vina, J. A Novel Nutrient Blend Mimics Calorie Restriction Transcriptional Patterns in Brain of Mice. Proceedings of the Oxygen Club of California 2016 World Congress; University of California at Davis, Davis, CA. A105; May 4-6, 2016