

Anti-Aging Medicine World Congress
“The Genetic Solution for Anti-Aging”
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INTRODUCTION

In the human body, there are approximately 30,000 genes. At birth a large number of genes are active to promote growth and intellectual development. As we age, fewer and fewer of these genes are active resulting in a slow-down in bodily function, weakened immunity, reduced metabolism, loss of energy, baldness, and other typical signs of aging. A new generation of supplements and cosmetics attempt to restore the activity of the genes to the level of the young adult age.

At a certain time during human life, shortly after the conception, most of the genes are active (Slide 1). Gradually, they are silenced during the development of embryo and fetus because their action is no longer needed. A substantial group of genes are silenced after birth due to a transition from different living conditions in the uterus to the extra-uterine environment after birth. At the age of 25, the body has the optimal combination of active genes, but soon thereafter groups of genes are turned off as the result of aging. Silencing of the genes is involved in hormonal changes during menopause, graying and loss of hair, reduced immunity, detoxification and formation of cancer. Down-regulation of tumor suppressor genes triggers increased activity of oncogenes, therefore increasing the risk of cancer. The continuous replacement of aging cells is becoming less efficient and the body is accumulating damaged and malfunctioning cells due to less effective programmed cell death. The process of gene silencing involves special chemical reaction known as “methylation of the gene promoters.” The end result is that “good” genes which promote regeneration and general health are “switched off” and “bad” genes that encourage deterioration and disease are “switched on.” The author’s theory of gene silencing in aging was published three years ago and confirmed by studies of prominent groups of researchers in a number of different laboratories (Slide 2). These studies performed in human and in animals confirmed that a substantial group of genes including tumor suppressors and genes for detoxification, cholesterol metabolism, inhibitors of programmed cell death, protein and RNA synthesis are silenced in aging (Slide 3). At the same time a small group of genes including oncogenes, chronic inflammation and those responsible for silencing of the other genes become overactive, possibly due to disturbed balance between “good and bad genes.”

Anti-aging interventions include lifestyle and environmental modification, therapeutic and nutritional replacement and restoration of optimal gene expression (Slide 4). The age management therapy goal is to reverse age-related deterioration to normal body function of young adults (Slide 5). On a molecular level, this translates to restoration of optimal gene expression; activation of silenced genes and normalization of over-active genes (Slide 6). Our group isolated a number of small molecules existing in the blood, dairy products, and royal jelly which regulate expression of the genes and used them in cell cultures and animal studies and human clinical trials (Slide 7). Among them are the naturally-occurring but synthetically produced amino-acid derivatives phenylacetylglutamine (PG), phenylacetylglutamine (isoPG), 3-phenylacetyl-amino-

2,6-piperidinedione (A10), and phenylacetate (PN) (Slide 8). PG activates genes which are silenced in aging, including tumor suppressors *PTEN* and *MAD*. PN works as a molecular switch which interrupts signaling in *RAS* oncogene pathway and activates tumor suppressors *p53* and *p21* through decreasing methylation of the promoters. A10 is metabolized in the small intestine to PG and isoPG. These compounds were formulated into a group of supplements and cosmetic products including Aminocare® A10, Aminocare Extra®, Aminocare Brain Longevity®, Aminocare® cream and Aminocare® lotion (Slide 9).

Oral administration of these supplements resulted in prevention of cancer, increased energy, and improved healing, cellular immunity, chronic joint inflammation, and prostate hypertrophy; and also decreased wrinkles, blood cholesterol concentration, frequency of viral infections, and benign breast nodules. Clinical trials confirmed that use of PG and isoPG in cosmetic cream and lotion provides excellent reduction of wrinkles.

CONCLUSION

Aging is associated with silencing of substantial number of genes through the reaction of methylation of gene promoters (Slide 13). Optimal gene expression can be restored by naturally-occurring molecules A10, PG, isoPG and PN which are ingredients of a new generation of Aminocare® supplements and cosmetics. Administration of these supplements and use of cosmetics produces marked anti-aging effect.