

## Could We Influence the Aging Process by Dietary Supplements?

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### **R**esults from an intervention study with selenium and coenzyme Q10

Aging represents very specific processes in different target organs in the body. In the skin different layers becomes thinner. There is a loss of bone mass, and joints becomes more stiffer and more prone to inflammation.

In the cardiovascular system there is a sign of more stiffness in the major vessels and the myocardium due to higher collagen content.

**Background:** The trace element Selenium is an essential element for all living cells to get an optimum function. Coenzyme Q10 is also needed for a normal cellular function. Selenium and coenzyme Q10 needs presence of each other in order to function optimally. The endogenous production of coenzyme Q10 decreases as the person becomes older. Inflammation, oxidative stress is areas where significant changes could be seen due to the aging process. Programmed cell death, apoptosis, is also increased as part of the aging process. Finally, in the cardiovascular system there are signs of increased fibrosis as part of aging.

**Method:** We have performed a prospective randomized double-blind placebo-controlled trial by giving selenium and coenzyme Q10, or placebo, to healthy elderly persons for 4 years. All patients were followed and no one was lost during the follow-up period. Blood samples were collected each 6<sup>th</sup> month.

Inflammation is one of the major components in disease, but is also seen with increasing age. Therefore, we evaluated seven biomarkers for inflammation in the study population, and applied a follow-up period of 5 years. Oxidative stress was evaluated by use of two biomarkers. Apoptosis was evaluated through analysis of insulin growth factor-1(IGF-1). To evaluate the activity of fibrosis, we evaluated eight different biomarkers for fibrosis.

**Results:** The main results were reduced mortality and increased cardiac function, but also signs of reduced inflammation as a result of the intervention with selenium and coenzyme Q10.

In six of the seven biomarkers significant reduction could be seen. Both the biomarkers for oxidative stress showed significant less oxidative stress in the active treatment group. The concentration of IGF-1 showed significant higher concentration in the active treatment group as a sign of less apoptosis.

The evaluation of eight different biomarkers for fibrosis demonstrated significantly less fibrosis in seven of the eight biomarkers, indicating less fibrosis.

**Conclusion:** Based on the intervention study with selenium and coenzyme Q10, we could demonstrate signs indicating less inflammation, less apoptosis and less fibrosis in those who received active treatment. All those processes are important in the aging process, why it seems that the intervention gave anti-aging effects.

### **Biography:**

Dr. Urban Alehagen is Professor in cardiology from University of Linköping, Sweden. He is specialist in internal medicine, cardiology and Odontology. During the last 15 years pioneer research of the effect of supplementation with selenium and coenzyme Q10 has been performed. From first demonstrating the clinical positive effects, further research has been performed. Dr. Urban's research group has investigated effects on oxidative stress and on inflammation by the supplementation, and the results are reported and published. Metabolomics studies, protein profile analyses, and micro-RNA influence by the intervention have been performed. And also demonstrated positive effects on the fibrosis tendency in the cardiovascular system as an indicator of aging by the intervention of selenium and coenzyme Q10.