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Nuts for Telomeres:

How to Slow the Aging Process

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Genetic, environmental, and lifestyle factors determine the very complex phenomenon of aging and life expectancy. Nutrition is a key component affecting our health, with the potential to improve both life expectancy and quality of life.

The three groups of people who tend to have the longest life spans of anyone in the world are the Okinawans (inhabitants of the Japanese island Okinawa), the Adventists in Loma Linda (California), and Sardinians (Italy)^{1,2}. It appears that not smoking, being active every day, keeping socially engaged, and eating fruits, vegetables, nuts and whole grains seem to be key factors that contribute to our longevity.

A wealth of archaeological evidence shows that tree nuts have been part of the human diet and have been used for their medicinal properties for millennia³. Nuts are nutrient-rich foods containing bioactive compounds with a synergistic effect in preventing and delaying many age-associated pathologies (e.g., cardiovascular diseases (CVD), type 2 diabetes mellitus (T2D), certain types of cancer, and several neurodegenerative diseases)⁴. The potential power of nuts to slow the aging processes is thought to be due to the modulation of their antioxidant activity. They have a high phytochemical content with antioxidant and anti-inflammatory effects, neuroprotection enhancement, and the capacity to modulate key cellular enzyme functions⁵, all of which contribute to health maintenance during aging. Recently, several scientific studies have pointed to the link between the phytochemicals in nuts and their role in preventing, improving and treating age-associated diseases. However, the aging process is multifactorial involving several players.

Telomere biology is just one of the mechanisms which has relatively recently been recognized in humans, with a high impact on the aging process and related diseases. New studies suggest that an active lifestyle and a healthy diet could have an effect on telomeres and may add years to our life⁶. Telomeres are the protective caps on chromosomes and play a fundamental role in human chromosomal stability⁷. Elizabeth Blackburn, the Nobel Prize-winner in Physiology or Medicine 2009, compares telomeres to the plastic tips that protect the end of your shoelaces. "The longer they are, the more they protect your DNA from "fraying" and falling to disease, and the more youthful and happier you will be". Indeed, the number of years that we remain healthy, active, and disease-free are closely related to the shortening of our telomeres, which contribute to ageing and life expectancy. TL is considered to be a biomarker of aging, with shorter telomeres associated with a decreased life expectancy and increased rates of developing age-related chronic diseases such as CVD, T2D and neurodegenerative diseases⁸⁻¹⁰. A high intake of nuts in the context of a healthy diet, such as the Mediterranean diet, is associated with a reduced risk of all-cause mortality^{11,12}. Numerous human clinical trials, including the PREDIMED study, have shown the important role of diet in telomere length⁹. However, the conclusions reached in these studies are often heterogeneous and inconclusive, since they take into account multiple factors that interact with each other.

Investigators from our research unit (Human Nutrition Unit, Rovira i Virgili University, Reus, Spain) have conducted for the first time a study analyzing the effect of chronic pistachio consumption in prediabetic subjects on cell-aging measures which protect against telomere loss (oxidative damage to DNA, telomere length and telomerase expression). The results of our study show that the expression of telomerase, the enzyme that helps protect against the loss of telomeres, is higher after pistachio consumption¹³. So, eating just a handful of pistachios as a part of our diet can positively affect



cellular aging and longevity by reducing oxidative damage to DNA and increasing the gene expression of certain enzymes responsible for the protection against the loss of telomeres.

Is there an anti-aging diet? A recent edition of *Advances in Nutrition* also reported a study evaluating the relationship between the consumption of certain foods, nutrients or the overall diet and the length of the telomeres. The systematic review included 59 observational studies and 11 clinical trials, selected from a methodical and organized search of the literature to separately identify the relationship between each food group, nutrient, dietary pattern and telomere health. The consumption of foods or dietary patterns high in antioxidants, such as nuts, fruits, vegetables, coffee and the Mediterranean diet, have been associated with longer telomeres. In contrast, high consumption of processed meat, alcohol and sugary drinks appears to be related to shorter telomeres¹⁴.

This research adds more evidence to the recent literature showing beneficial effects of nut consumption on telomere health and longevity, and the subsequent prevention of cell aging¹⁵⁻¹⁷.

Several observational studies have reinforced the suggested benefits of adhering to the Mediterranean diet (a nut-rich dietary pattern) on TL, which further support the research on the benefits of nuts in promoting health and longevity¹⁷.

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Evidence and research have shown that we can actually lower our biological age by maintaining a healthy weight, diet and lifestyle no matter our chronological age. However, more studies are required to confirm the role of nuts in preventing telomere shortening, using prospective epidemiological studies and clinical trials. ■



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