

# Telomeres and Telomerase in Aging, Longevity, and Health

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(2009) Faculty of Medicine Theses  
(Master thesis)

## Abstract

Drs. J. Watson and A. M. Olovnikov described the natural phenomenon of an “end replication problem” in the 1970s. The problem arises from the inability of a polymerase enzyme to fully replicate a linearized chromosome, resulting in a cumulative erosion of the ends of chromosomes during each cell division. ... [read more](#)

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Author keywords: Telomeres, Telomerase, Aging, Cancer, Evolution, Senescence, Biogerontology



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Telomerase replenishes telomeres, extending the cell's lifespan. Researchers hope that telomerase enhancement will rejuvenate our organs. Ordinary cells are prohibited from using telomerase, and their telomeres shorten with each division until they die. When all a cell has divided about 50 times and all the telomeres have been removed, the cell usually self-destructs, in a process called apoptosis. How Telomeres Work. Like the rest of the material in our chromosomes, telomeres are composed of double strands of DNA. Telomerase gene therapy in adult and old mice delays aging and increases longevity without increasing cancer. August 2012, EMBO Molecular Medicine. doi:10.1002/emmm.201200245. Available Online. Before telomeres and their function were properly understood, a breakthrough study published in the Journal of Personality and Social Psychology in 1989 examined the effects of meditation practice on health factors in the elderly. Two types of meditation, Transcendental Meditation and general Mindfulness Training, were used by patients at elderly care homes. It wasn't until we fully understood the function of telomeres and aging that scientists were able to see a clear picture of meditation's benefits. A multitude of studies have begun to demonstrate how meditation can help lengthen telomeres and slow the rate of cellular aging. What does that even mean? Here are the details. DNA details. The Cellular Connection to Longevity: Telomeres, Aging and the Keys to Lifelong Health. [excerpt from the telomere effect book]. BY ELIZABETH BLACKBURN, Ph.D. & ELISSA EPEL Ph.D. researchers may have finally cracked the code to aging—the length and health of our telomeres, which are tiny but extraordinarily important pieces of genetic code stored deep within our cells. Share: What Are Telomeres and Why They Matter: The Keys to Longer Lifespan. They also found that regardless of exercise type, those who increased their aerobic fitness the most had greater increases in telomerase activity.