

# Length of biological marker associated with risk of cancer

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A new study suggests that shorter length of leukocyte telomeres - chromosome markers of biological aging - are associated with an increased risk of cancer and death from cancer, according to a study in the July 7 issue of *JAMA*. A leukocyte is a type of blood cell.

Telomeres are a structure at the end of a chromosome involved in the replication and stability of the chromosome. [Genetic factors](#) and environmental stressors can shorten the length of the telomere, and telomere length has been considered to be an emerging marker of biological age. Some research has suggested that short telomeres and chromosomal instability contribute to malignant cell transformation. "Proof of concept for this intriguing hypothesis remains to be established from an epidemiological perspective," the authors write.

Peter Willeit, M.D., of Innsbruck Medical University, Innsbruck, Austria, and colleagues conducted a study to assess the association between leukocyte telomere length and risk of both new-onset cancer and cancer death. Leukocyte telomere length was measured by quantitative [polymerase chain reaction](#) (laboratory technique used to analyze DNA) in 787 participants, free of cancer in 1995, and part of the prospective, population-based Bruneck Study in Italy. The primary outcomes analyzed included the incidence of new cancer and [cancer mortality](#) over a follow-up period of 10 years (1995-2005).

During follow-up, a total of 92 of 787 participants (11.7 percent) developed cancer. Analysis indicated that short telomere length at the beginning of the study was associated with new cancer independently of standard cancer risk factors. Compared with participants in the longest telomere length group, participants in the middle length group had about twice the risk of cancer, and those in the shortest length group had approximately three times the risk. Cancer

incidence rates were inversely related to telomere length, with participants in the group with the shortest telomere length having the highest rate of cancer.

Short telomere length was also associated with a higher rate of death from cancer. "Of note, telomere length was preferentially associated with individual cancers characterized by a high fatality rate such as gastric, lung, and ovarian cancer, but less so with tumors linked to better prognosis," the authors write. They add that telomere length had a similar predictive value for [cancer](#) in both men and women and in various age groups.

"A variety of experimental and genetic studies support the hypothesis that telomere attrition contributes to the manifestation and dissemination of malignancies. While fully functional telomeres confer protection of the genome, shortened telomeres facilitate chromosomal instability," the researchers write.

**More information:** *JAMA*. 2010;304[1]:69-75.

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