

Telomere length

Principal Investigators: [Anita Kloss-Brandstätter](#) and [Florian Kronenberg](#)

Background and previous findings

Telomeres play a key role in the maintenance of chromosome integrity. Short telomeres are linked to age-associated diseases and cancer. We developed a high-throughput real-time PCR assay to determine the decrease rate of relative telomere length (RTL) over 10 years.

We found that the telomeres shortened, on average, by 455 bp over 10 years. Short telomere length at baseline was associated with incident cancer independently of standard cancer risk factors. Furthermore, short telomere length was associated with cancer mortality and individual cancer subtypes with a high fatality rate.

In addition, we found that the RTL was inversely correlated to family history of CVD. Participants with CVD events during follow-up had significantly shorter telomeres. Remarkably, RTL was strongly associated with advanced, but not early, atherogenesis.

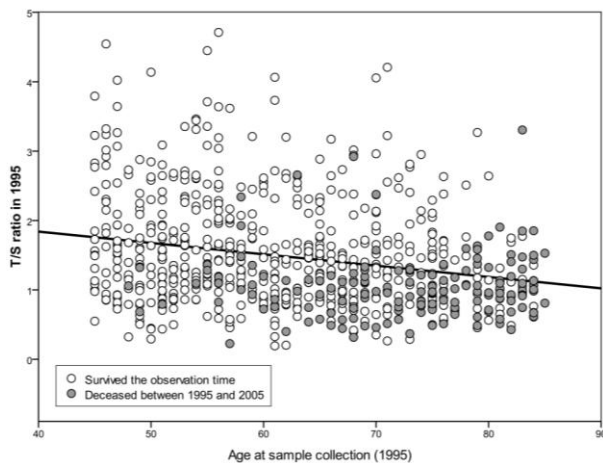


Figure: RTL (expressed as T/S ratio) at the time of sample collection in dependence of the participants' age.

Ongoing work

- Determination of RTL in the SAPHIR study (n=1750) and other populations.

Team members:

Margot Haun, Julia Raschenberger

Main collaborators:

Stefan Kiechl, Peter Willeit, Johann Willeit

Selected Publications:

1. Ehrlenbach S, Willeit P, Kiechl S, Willeit J, Reindl M, Schanda K, Kronenberg F, Brandstätter A: Influences on the reduction of relative telomere length over ten years in the population-based Bruneck Study: introduction of a well-controlled high-throughput assay. *International Journal of Epidemiology* 38:1725-1734, 2009. [\[Pub-Med\]](#)
2. Willeit P, Willeit J, Brandstätter A, Ehrlenbach S, Mayr A, Gasperi A, Weger S, Oberhollenzer F, Reindl M, Kronenberg F, Kiechl S: Cellular aging reflected by leukocyte telomere length predicts advanced atherosclerosis and cardiovascular disease risk. *Arteriosclerosis Thrombosis and Vascular Biology* 30:1649-1656, 2010. [\[Pub-Med\]](#)
3. Willeit P, Willeit J, Mayr A, Weger S, Oberhollenzer F, Brandstätter A, Kronenberg F, Kiechl S: Telomere length and risk of incident cancer and cancer mortality. *JAMA* 304:69-75, 2010. [\[Pub-Med\]](#)
4. Ehrlenbach S, Willeit P, Kiechl S, Willeit J, Reindl M, Schanda K, Kronenberg F, Brandstätter A: Raising the bar on telomere epidemiology. *International Journal of Epidemiology* 39:308-309, 2010. [\[Pub-Med\]](#)
5. Willeit P, Willeit J, Kloss-Brandstätter A, Kronenberg F, Kiechl S: Fifteen-year follow-up of association between telomere length and incident cancer and cancer mortality. *JAMA* 306:42-44, 2011. [\[Pub-Med\]](#)
6. Kloss-Brandstätter A, Willeit P, Lamina C, Kiechl S, Kronenberg F: Correlation between baseline telomere length and shortening over time—spurious or true? *International Journal of Epidemiology* 40:840-841, 2011. [\[Pub-Med\]](#)