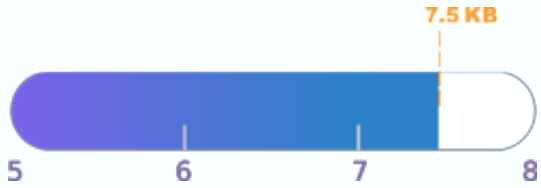
DIEGO IRURETAGOYENA
TELOMERE LENGTH REPORT
And How Their Length Affects You

TruDiagnostic™ The Epigenetic Company

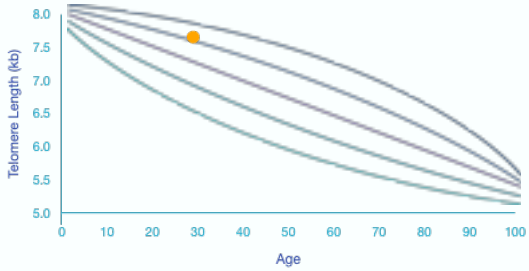
YOUR RESULTS:

Average Telomere Length



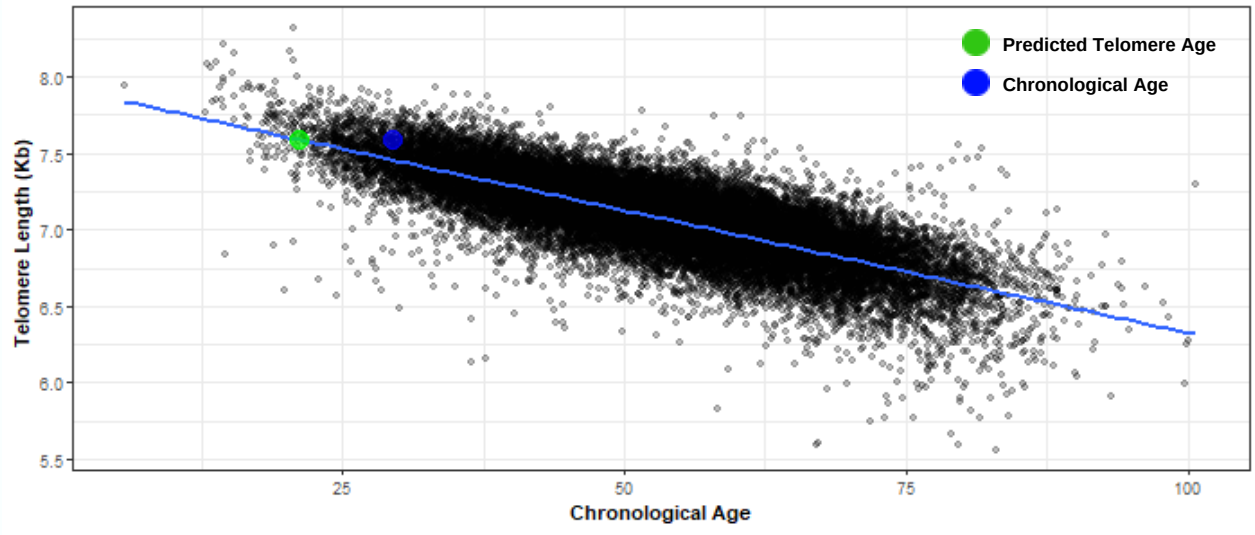
Your average telomere length is:
7.59 kilobases (Kb).

Your Percentile



At your chronological age of **29.44**, you would be in the **83.48rd** percentile of telomere length compared to others of your same chronological age. This means that your telomeres are longer than **83.48%** of people your age

Your Telomere Length Based Biological Age Prediction



Estimated Telomere Age: 21.13

If we were to use the data from our sample subjects to predict your biological age from your telomere measurement we would anticipate your age to be **21.13.**

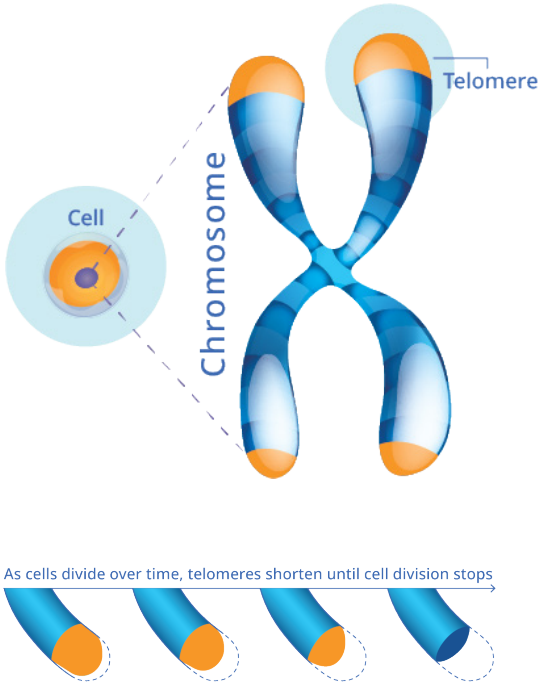
Introduction to Telomeres

Telomeres are repeating sequences of nucleotide sequences (TTAGGG) that tag the ends of all chromosomes. They are designed to prevent unpredictable changes in the DNA strand, keeping the genome stable [3].

Their primary function is to prevent chromosomal "fraying" when a cell replicates, much like the plastic tips on the end of shoelaces [5]. As a cell ages, its telomeres become shorter.

This shortening is thought to be one of several factors that causes cells to age. In actively dividing cells, such as those in the bone marrow, the stem cells of the embryo, and germ cells in the adult, telomere length (TL) is kept constant by the enzyme telomerase.

As the organism grows, this enzyme becomes less active over time. This leads to a slow decrease in telomere length, until a point is reached at which the cell is no longer capable of replication ('replicative senescence'). A cell can no longer divide when telomeres are too short—once they reach a critical point, the cell becomes inactive (or 'senescent'), slowly accumulating damage that it can't repair, or it dies [6].



Why are Telomeres Important?

Telomere length is affected by both genetic and epigenetic contributions. A new study found that DNA methylation is closely linked to TL. The study by researchers at the University of California Los Angeles shows a very significant linkage between two different markers that indicate aging [2].

Telomeres are an essential part of human cells that affect how our cells age [1]. Telomere length has emerged as an important determinant of replicative senescence and cell fate - an important indicator of the aging process and a wide range of disease states, including cancers, cardiovascular disease, and age-related disorders.

Shorter telomeres are not only associated with age but with disease too. In fact, shorter telomere length and low telomerase activity are associated with several chronic preventable diseases. These include hypertension, cardiovascular disease, insulin resistance, type 2 diabetes, depression, osteoporosis, and obesity.

Shorter telomeres have also been implicated in genomic instability and oncogenesis. Older people with shorter telomeres have three and eight times increased risk to die from heart and infectious diseases, respectively [4].

The rate of telomere shortening and telomere length is therefore critical to an individual's health and pace of aging.

REFERENCES

1. Jaskelioff, M., Muller, F. L., Paik, J.-H., Thomas, E., Jiang, S., Adams, A. C., Sahin, E., Kost-Alimova, M., Protopopov, A., Cadiñanos, J., Horner, J. W., Maratos-Flier, E., & DePinho, R. A. (2011). Telomerase reactivation reverses tissue degeneration in aged telomerase-deficient mice. Nature, 469(7328), 102–106. https://www.researchgate.net/publication/49640982_Telomerase_reactivation_reverses_tissue_degeneration_in_aged_telomerase-deficient_mice

2. Lee, Y., Sun, D., Ori, A. P. S., Lu, A. T., Seeboth, A., Harris, S. E., Deary, I. J., Marioni, R. E., Soerensen, M., Mengel-From, J., Hjelmborg, J., Christensen, K., Wilson, J. G., Levy, D., Reiner, A. P., Chen, W., Li, S., Harris, J. R., Magnus, P., … Horvath, S. (2019). Epigenome-wide association study of leukocyte telomere length. Aging, 11(16), 5876–5894. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6738430/

3. Lu, A. T., Seeboth, A., Tsai, P.-C., Sun, D., Quach, A., Reiner, A. P., Kooperberg, C., Ferrucci, L., Hou, L., Baccarelli, A. A., Li, Y., Harris, S. E., Corley, J., Taylor, A., Deary, I. J., Stewart, J. D., Whitsel, E. A., Assimes, T. L., Chen, W., … Horvath, S. (2019). DNA methylation-based estimator of telomere length. Aging, 11(16), 5895–5923. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6738410/

4. Shammas M. A. (2011). Telomeres, lifestyle, cancer, and aging. Current opinion in clinical nutrition and metabolic care, 14(1), 28–34. https://doi.org/10.1097/MCO.0b013e32834121b1

5. Songyang, Z. (2017). Introduction to Telomeres and Telomerase. Methods in Molecular Biology (Clifton, N.J.), 1587, 1–13. https://pubmed.ncbi.nlm.nih.gov/21461806/

6. Zvereva, M., Shcherbakova, D., & Dontsova, O. (2010). Telomerase: Structure, functions, and activity regulation. Biochemistry (00062979), 75(13), 1563–1583. https://www.researchgate.net/publication/50591672_Telomerase_Structure_functions_and_activity_regulation