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Telomers and Cell Aging

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Telomers, and their length, have recently been implicated as a risk factor for heart disease. This short article discusses just what this important parts of your genetic makeup are - and sheds some light upon them as the secret of aging.

A mammalian cell, in general, reproduces by a process of division termed mitosis. This, in theory, provides for an infinite supply of cells and there should be no need for aging. Unfortunately, each time a cell divides it is possible that there will be mistakes in the copying of DNA, termed mutations. Most mutations within a mature tissue are harmless, however there others can cause serious disease; most notably cancer in which cells divide without proper restraint. With each division the chance of a problematic mutation increases and so, over the course of evolution, a limit has developed upon the number of times a cell divides.

At one end of a chromosome is located a long region of repetitive DNA termed the telomere. This acts as a buffer during replication because the DNA polymerase complex which duplicates DNA is unable to deal with the very tail of the DNA molecule much as a desktop printer is often unable to print to the very bottom edge of the page.

Each time the cell is copied some of the telomere region is omitted, making the overall length of the chromosome shorter. As the telomere doesnt contain important genetic information this loss does not cause a problem to the cell, but it does provide a fool-proof way of counting the number of divisions that have taken place. When the telomere runs out then the cell will no longer divide, the limiting number of divisions being termed the Hayflick limit. A reduction of cell metabolism has also been linked to telomere length.

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