

**LITERATURE REVIEW ON THE  
EFFECTIVENESS OF  
TELOMERE LENGTHENING  
AGENTS IN HUMAN  
REGENERATIVE  
HEALTH**

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## ABSTRACT

Human life begins with a single fertilized cell which contains genetic information coded in the sequences of nucleotides called Deoxyribonucleic Acids or DNA. Throughout human development from a single cell to millions of cells in adult human being, many cell divisions have to occur. During all these multiple cells division, the genetic information is copied repetitively. Each time the DNA is copied, slight information are lost. Thankfully, the information losses are in the form of 'dispensable codes' called telomeres. As such, telomeres actually act as protective caps at the end of the DNA sequences. However, eventually even these protective caps (telomeres codes) will eventually runs out and thus allowing no more cells division. The cells therefore stop dividing and henceforth ages and eventually die. This is when human starting to develop various kinds of age related degenerative diseases. When there are too many cells which have stop dividing, aged and died, the human organism itself eventually dies. Based on this theoretical shortening of telomeres as the main cause of human aging, an agent which can increase or maintain the length of telomere is thought to be the ultimate answer to human health and longevity. There are mainly two classes of products on the markets which are claimed to lengthen human telomeres. They are the animal derived telomerase and the herb called *Astragalus Membranaceus* which can activate the gene expression of human telomerase. Unfortunately, there is no study to prove the effectiveness of the first product and a study on the second product is not convincing enough in its effectiveness in lengthening human telomeres.