

Telomere replication

The ends of the linear chromosomes are known as telomeres. Repetitive sequences that code for no particular gene. The telomeres protect the important genes from being deleted as cells divide and as DNA strands shorten during replication.

In humans, a six base pair sequence, TTAGGG is repeated two to 1000 times. After each round of DNA replication, some telomeric sequences are lost at the 5' end of the newly synthesized strand on each daughter DNA, but because these are non-coding sequences, their loss does not adversely affect the cell. However, even these sequences are not unlimited. After sufficient rounds of replication, all the telomeric repeats are lost and the DNA here being coding sequence with subsequent rounds.

The discovery of the enzyme telomerase helped in the understanding of how chromosome ends are maintained. The telomerase enzyme attaches to the end of a chromosome and contains a catalytic part and a built-in RNA template. Telomerase adds complementary RNA bases to the 3' end of the DNA strand. Once the 3' end of the lagging strand template is sufficiently elongated, DNA polymerase adds the complementary nucleotides

to the ends of the chromosomes, thus the ends of the chromosomes are replicated.