

Telomere: characteristics and functions

Telomeres are the non-coding portions of DNA sequences at the end of each linear chromosome. Mammalian telomeres consist of 5-8 nucleotides with repeated sequences of TTAAGGG. Their functions are identifying the end of chromosomes, preventing the end of chromosome to be adhesive, protecting the chromosome termini from incorrect connection and degradation, appropriate chromosome location in a nucleus, and synthesize of the end of chromosomes in DNA replication. In DNA replication procedures, lagging strand synthesis are observed unable to copy the extreme end of linear chromosomes. This results in shortening of the length of DNA molecules in several mitosis, which is called “end replication problem”. In most eukaryotic cells, telomerase, which is a ribonucleoprotein DNA polymerase complex, as a reverse transcriptase solve the problem by telomere synthesis. In the absence of telomerase activity, telomeres progressively are become short and potentially deleted genes. Due to this shortness and lack of information, the cell is driven to death so the level of telomerase activity is an important factor in determining telomere length and in lifespan and reproductive capacity of cells. Tumor cells have a special capability in producing telomerase, so this matter could be regarded as a mean in treating cancers.