

Dhaka the 9th of Oct., '09. The current year's Nobel Prize in medicine was awarded to three USA Professors, Elizabeth H. Blackburn, Carol W. Greider and Jack W. Szostak for their outstanding discovery on "how chromosomes are protected by telomeres and the enzyme telomerase". The telomeres are like the caps on the chromosome ends for their protection.

It's known since mid-80's of the last century that telomerase, an enzyme is involved in telomere repair. Cell biologists also observed that cancer chromosomes are immortal, while normal ones are not. The causes were soon known that there is no wear and tear in fast replicating cancer chromosomes while the telomeric ends of a normal chromosome are worn out.

When studying the chromosomes of *Tetrahymena*, a unicellular ciliate organism, Elizabeth Blackburn identified in it a RNA sequence that was repeated several times together with a specific protein at the ends of each chromosome. What was astonishing that the same telomeric DNA sequence of *Tetrahymena*, namely, the CCCCAA sequence were found to protect chromosomes of yeast which is phylogenetically completely unrelated, thereby showing the existence of a previously unrecognized fundamental mechanism.

Later on, it was discovered that the telomere with its characteristic sequence is present in most plants and animals from amoeba to man. Using *Tetrahymena*, the above scientists constructed mini-chromosomes comprising a centromere and two short inverted segments containing the same bases but in the reverse order. They introduced the artificial mini-chromosomes into two sets of yeast cells: one set received mini-chromosomes with several units of telomeric sequence of DNA and the other no telomeres. The Nobel Laureates demonstrated that while the minichromosomes with telomeres did not suffer any damage, those without them collapsed and disappeared.