

The guanine quadruplex (G4) DNA structure dynamics and its involvement in the gamma radiation responsive gene expression and radioresistance in *Deinococcus radiodurans* have been elucidated.

A very high density of guanine repeats (G motifs) have been observed in the genome of all the organisms. Structural studies showed that these G motifs can form non Watson-Crick type secondary structure in dsDNA. G4DNA is shown to regulate various molecular events needed for survival in any organism. We observed that the arrest of G4 DNA structure dynamics has direct impact on the radioresistance of *Deinococcus radiodurans*. Later on, this effect was found to be by suppressing the DNA damage responsive expression of very important DNA repair genes in this bacterium. G4 DNA structure stability is regulated by topoisomerases and RecQ enzyme in this bacterium.

