Protein Targeting of the G-Quadruplex Structure: Recognition Drives DNA Unfolding

G-quadruplexes are unique highly conserved repetitive G-rich sequences that are located in strategic regions of chromosomes and are important for biological functions such as transcriptional promoter regions and at the telomeric ends of eukaryotic chromosomes. Human telomeric DNA is a single stranded region located at the terminal ends of chromosomes with a 3’-end overhang containing tandem repeats of d(TTAGGG)n sequence. This non-coding overhang protects genomic DNA from end fusion and is required for maintenance of chromosomal integrity during replication. This presentation will focus on a highly selective interaction of a protein, UP1, to the human telomere G-quadruplex, The binding of UP1 to the G-quadruplex is driven by structural recognition and the energetics associated with this protein-DNA complex formation is used to drive the unfolding of the G-quadruplex structural motif.

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