

During transcription and DNA replication, the DNA needs to be unwound in order for the transcription/replication machinery to gain access to the DNA so it can be copied or replicate, respectively. TOPO1 or topoisomerase I, is an enzyme that acts by transiently cutting one strand of the DNA to relax the coil and extend the DNA molecule. The regulation of DNA supercoiling is essential to DNA transcription and replication, when the DNA helix must unwind to permit the proper function of the enzymatic machinery involved in these processes.

Genomic amplification of TOPO1 in colorectal cancer has been described and correlates with increased RNA and protein expression.

TOPO1 is the target of the camptothecin derivatives irinotecan and topotecan. Higher expression of TOPO1 has been associated with response to first-line chemotherapy containing irinotecan, a TOPO-1 inhibitor.

