Topoisomerases catalyze the interconversion between topological states of DNA by breaking and rejoining DNA strands. These changes in DNA topology are required during several cellular processes such as replication, transcription, recombination, and chromosome condensation. There are three classes of topoisomerases that are distinguished by substrate. Type I topoisomerases cleave one DNA strand, while Type II enzymes cleave a pair of complementary DNA strands. The type IB topoisomerases relax both positively and negatively supercoiled DNA; TOP1 encodes the type IB enzyme in yeast. Type IA topoisomerase, encoded by TOP3 in yeast, relaxes only negatively supercoiled DNA, and yeast topoisomerase II is encoded by the TOP2 gene. Topoisomerases are highly conserved; yeast Top1p shares 57% identity with human Top1. The Top1 protein, like other type IB topoisomerases, relaxes supercoiled DNA by forming a DNA-enzyme complex and transiently cleaving one strand via a nucleophilic attack that results in a covalent linkage with the 3' end of the cleaved strand. The 5' end can then rotate freely. Top1p is the target of the antitumor drug camptothecin. Camptothecin increases the half-life of the enzyme-DNA complex, which results in double-stranded DNA breaks during DNA replication. Specific amino acid substitutions in Top1p have the same effect as the drug. Suppressors of these mutations were identified that reduced the enzyme's affinity for DNA.