**EUKARYOTIC REPLICATION**

Replication starts with helicase unwinding DNA forming a replication fork, while single-stranded DNA-binding proteins hold each strand to stabilize them, and topoisomerase prevents the DNA ahead of the fork from coiling. DNA Primase then places primers along the strands to serve as starting points for replication. DNA polymerase then binds at the site of primers, and starts synthesizing in a 5’ to 3’ direction. Since DNA is antiparallel, one strand is synthesized continuously while the other is not; termed as leading and lagging strand, and synthesized by Pol δ and Pol α, respectively. The lagging strand synthesis is discontinuous because its 5’ to 3’ is away from the fork. Multiple primers are placed on it still in the 5’ to 3’ direction, and Pol α beginsits synthesis from these primers; forming Okazaki fragments. After synthesis, polymerases remove primers from their respective strands and replace them with DNA, filling the gaps between fragments. DNA ligase then seals the breaks between Okazaki fragments, and joins the DNA fragments together. Additionally, Pol β repairs nuclear DNA, and Pol γ is responsible for mitochondrial DNA replication. At the end, the process produces two DNA strands, each having an old, and a new strand