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LEVEL: 200

1. STEP I: Replication Fork Formation:

Before DNA can be replicated, the double stranded molecule must be unzipped into two single strands. DNA has four bases called Adenine{A}, Thymine{T}, Cytosine{C} and Guanine{G} that form pairs between the two strands. Adenine only pairs with thymine and cytosine only binds with guanine. In order to unwind DNA, these interactions between base pairs must be broken. This is performed by an enzyme known as DNA helicase.

STEP II: Primer Binding:

The leading strand is the simplest to replicate. Once the DNA strands have been separated, a short piece of RN called a primer binds to the 3' end of the strand. The Primer always binds as the starting point for replication. Primers are generated by the enzyme DNA primase.

STEP III: Elongation:

Enzymes known as DNA polymerases are responsible creating the new strand by a process called elongation. There are five different known types of DNA polymerases in bacteria and human cells. In bacteria, such as E coli polymerase III is the main replication enzyme, while polymerase I, II, IV and V are responsible for error checking and repair. DNA polymerase III binds to the strand at the site of the primer and begins adding new base pairs complementary to the strand during replication.

STEP IV: Termination:

Once both the continuous and discontinuous strands are formed, an enzyme called exonuclease removes all RNA primers are then replaced with appropriate bases, Another exonuclease 'Proofreads' the newly formed DNA to check, remove and replace any errors.

2. I. Topoisomerase relaxes the super-coiled DNA
   II. DNA helicase unwinds the double helix at the replication fork.
   III. Primase provides the starting point for DNA polymerase to begin synthesis of the new strand.
   IV. DNA polymerase synthesizes the new DNA strand also proofreads and corrects some errors.

V. DNA ligase re-joins the two DNA strands into a double helix and joins Okazaki fragments of the lagging strand.