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DEPARTMENT: MEDICAL LABORATORY SCIENCE

LEVEL: 200

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1. Highlight the steps of DNA replication

**ANSWER**

DNA replication is the production of identical DNA helices from a single double-stranded DNA molecule. Prior to replication, the DNA uncoils and strands separate. The steps of DNA replication are;

* Replication fork formation: The double stranded molecule must be unzipped into two single strands before DNA can be replicated.
* Primer binding: The leading strand is the simplest to replicate. Once the DNA strands have been separated, a short piece of RNA called a primer binds to the 3’ end of the strand. The primers always bind as the starting point for replication.
* Elongation
* Termination
1. Outline the functions of DNA replication enzymes

**ANSWER**

DNA replication would not occur without enzymes that catalyze various steps in the process. Enzymes that participate in the eukaryotic DNA replication process include:

* DNA HELICASE: It unwinds and separate double stranded DNA as it moves along the DNA. It forms the replication fork by breaking hydrogen bonds between nucleotide pairs in DNA.
* DNA POLYMERASES: Synthesize new DNA molecules by adding nucleotides to leading and lagging DNA strands.
* DNA GYRASE: Unwinds and rewinds DNA strands to prevent the DNA from becoming tangled or supercoiled.
* DNA PRIMASE: A type of RNA polymerase that generates RNA primers. Primers are short RNA molecules that act as templates for the starting point of DNA replication.
* DNA LIGASE: Joins DNA fragments together by forming phosphodiester bonds between nucleotides.