Tutorial 2: DNA Replication

Answer all questions below.

1. What is a gene, and why must it be duplicated before cell division?
2. Describe the basic structure of DNA as proposed by Watson and Crick.
3. Explain the process of semiconservative replication in DNA replication.
4. What is the role of DNA helicase in DNA replication?
5. What is the significance of Okazaki fragments, and how are they joined together?
6. Why are RNA primers necessary during DNA replication?

1. Gene is the unit of heredity. It must be duplicated before cell division because each cell needs a complete set of genes.
2. Watson and Crick proposed that DNA is a double helix structure, composed of long strands of sugars-phosphate groups and nitrogenous bases (A-adenine, T-thymine, G-guanine, C-cytosine).
3. In semiconservative replication, the parental strands will separate and it will receives new strand of DNA. As a result, each new set of DNA molecule consists of one old and one new strand.
4. DNA helicase unwinds the DNA double helix by breaking the hydrogen bonds between base pairs, separating the two strands.
5. Okazaki fragments joined together to give a complete strand of DNA. They joined together by the enzyme DNA ligase to create the lagging strand during DNA replication.
6. RNA primers necessary during DNA replication to initiate polynucleotide synthesis.