Replisomes Encyclopedia Article

Replisomes

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Replisomes

Replisome refers to a complex of proteins that are engaged in the elongation of the newly synthesized strand of **deoxyribonucleic acid**. The replisome assembles at the **replication** fork, the region where the new **DNA** stand is being made.

The replisome complex assumes three principle functions, DNA **polymerase**, DNA primase and DNA helicase. The helicase, a donut-shaped enzyme, initiates replication by unwinding the two parental DNA strands. The structure of the helicase was elucidated in 1999 using the technique of **x-ray crystallography**. It has been determined that the helicase moves along the DNA strand very quickly, 300 paired nucleotides per second. Once the DNA strands are unwound, single stranded **DNA binding proteins** attach to each unwound strand, preventing the strands from winding back together. Subsequently, DNA polymerase catalyzes the elongation of each strand. The polymerase is able to operate in a continuous fashion on the leading parental strand that is unwinding. On the other strand, the DNA primase molecule builds **primers**, which are eventually connected to the other replicated DNA strand.