

→ 5' exonuclease

incoming dNTP

DNA POLYMERASES

Discovery, Characterization and Functions
in Cellular DNA Transactions

Maintenance of the information embedded in the genomic DNA sequence is essential for life. DNA polymerases play pivotal roles in the complex processes that maintain genetic integrity. Besides their tasks *in vivo*, DNA polymerases are the workhorses in numerous biotechnology applications such as the polymerase chain reaction (PCR), cDNA cloning, genome sequencing, nucleic acids-based diagnostics and in techniques to analyze ancient and otherwise damaged DNA. Moreover, some diseases are related to DNA polymerase defects, and chemotherapy through inhibition of DNA polymerases is used to fight HIV, Herpes and Hepatitis B and C infections. We have recently witnessed the discovery of an abundance of novel DNA polymerases in viruses, bacteria, archaea and eukaryotes with specialized properties whose physiological functions are only beginning to be understood. This book summarizes the current knowledge of these fascinating enzymes. It is intended for a wide audience from basic scientists, to diagnostic laboratories and to clinicians who seek a better understanding of these fascinating enzymes.

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