Crystal Structure of DNA Polymerase from Bacteriophage M2

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DNA polymerases are a group of enzymes that use single-stranded DNA as a template for the synthesis of the complementary DNA strand and are a central player in DNA repair and replication. The many known DNA polymerases can be classified into six families based on phylogenetic relationships: families A, B, C, D, X and Y. DNA polymerase from bacteriophage M2 (M2 DNA polymerase) is classified into B-family DNA polymerase. M2 DNA polymerase replicates the genome of bacteriophage M2. The enzyme can start to synthesize DNA using a primer-protein as a primer and does not require DNA/RNA primers. We are involved in structural analysis of M2 DNA polymerase to clarify the relationship of its structure and function. Crystals of M2 DNA polymerase were obtained by hanging drop vapor diffusion technique. The crystal belongs to the space group of $P6_122$ and the unit cell parameters are $a = b = 97.0$, $c = 292.1$ Å and $\gamma = 120°$. All X-ray data was collected at SPring-8 BL41XU. Crystal structure of M2 DNA polymerase was determined by multiple isomorphous replacement method with anomalous scatterings using Hg and Pt derivatives at 3.0 Å resolution. Phase calculation was perfomed with the programs *SOLVE* and *RESOLVE*. The structure was refined with the programs *CNS* and *REFMAC*.

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