

Direct imaging of *E. coli* RNA polymerase and transcription complex with promoter region of DNA

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Electron microscopy combined with improved low angle rotary shadowing at low temperature under high vacuum was available for molecular structural analysis of polymerase and its binding to DNA. It is well known biochemically that *E. coli* polymerase consists of 5 subunits, 2α , β , β' and δ particular, it is not elucidated how to bind with DNA promoter region. The rotary shadowed imaging revealed polymerase that β , β' subunits were stacked on 2α subunits, forming large channel between them, 3nm in width. On binding with the promoter region of DNA, DNA strand was found in this large channel. Comparative observation of core enzyme without δ factor suggested that δ factor should be placed along this channel together with DNA. Another small channel was recognizable between β and β' . Taking the affinity of β subunit to mRNA into account, small channel between β and β' may be for newly synthesizing mRNA.