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SOLUTION STRUCTURE AND INTERACTION ON THE CARBOXYL-TERMINAL DOMAIN OF *ESCHERICHIA COLI* RNA POLYMERASE  $\alpha$  SUBUNIT STUDIED BY NMR

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The three-dimensional structure of the carboxyl-terminal domain of the *E.coli* RNA polymerase  $\alpha$  subunit, which is regarded as the contact site for transcription activator proteins and the promoter UP element, was determined by NMR spectroscopy. Its compact structure of four helices and two long arms enclosing its hydrophobic core shows a folding topology distinct from those of other DNA-binding proteins. The UP element binding sites was found on the surface comprising helix 1, the amino-terminal end of helix 4, and the preceding loop. Mutation experiments indicated that the contact sites for transcription activator proteins are also on the same surface. Analysis of the dynamics data reveals that at least 13 residues between the N- and C-terminal domains have quite higher flexibility than the other structural parts, providing an evidence for the existence of a long flexible loop between the two domains