

Researchers unravel RNA polymerase structure

Researchers at Stanford University, the United States, have identified the structure of the RNA polymerase protein, one of the pivotal molecules in biology. The polymerase transcribes genes from DNA to RNA, which is an essential step in protein synthesis. The structure provides the basis for understanding all gene activity in eukaryotic cells and is arguably the most important protein in molecular biology and biotechnology.

RNA polymerase II is the first apparatus in the production line from gene to protein. Its task is to faithfully copy regions of gene-containing DNA into strands of messenger RNA (mRNA). Once a gene has been copied into mRNA, the next step is production of the protein that is coded for by that gene. The protein-making machinery (the ribosome) uses the mRNA as a template for protein production, during the process of translation. The RNA polymerase enzyme actually consists of 12 separate protein sub-units. Using data collected via X-ray crystallography, researchers have constructed a model of how the individual sub-units fit together to form the entire RNA polymerase complex. (AgBiotech Reporter, June 2000)