The highly efficient T7 RNA polymerase: A wonder macromolecule in biological realm

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ABSTRACT

The study of bacteriophage has always been of keen interest for biologists to understand the fundamentals of biology. Bacteriophage T7 was first isolated in 1945 and its first comprehensive genetic map of was published in 1969. Since then, it gained immense attention of researchers and became a prime model system for experimental biologists. The major gene product of T7 phage, T7 RNA polymerase (T7RNAP), continues to attract researchers since a long time due to its high and specific processivity with a single subunit structure and its capability of transcribing a complete gene without additional proteins. Since the first review article in 1993 there has been around nine reviews on this polymerase till year 2009, most of which focussed on particular aspects of T7RNAP such as structure and function. However, this review encapsulates a broad view on T7RNAP, one of the simplest macromolecule catalyzing RNA synthesis including recent updates on its applications, structure, activators and inhibitors. Thus this brief review bridges the huge gap on the recent updates on this polymerase and will help the biologists in their endeavours that include the use of T7RNAP.

Keywords: Bacteriophage T7, RNA polymerase, Lysozyme, Transcription.