

Protein synthesis is a vital biological process by which cells produce proteins, involving transcription (DNA to RNA) and translation (RNA to protein). General Transcription Factors: Proteins like TFIIB, TFIID, etc., assist RNA polymerase binding to the promoter. b. Initiation Factors Eukaryotic Initiation Factors (eIFs): Assist in ribosome assembly on mRNA (e.g., eIF4E, eIF2). Ribosomes: The site of protein synthesis, composed of ribosomal RNA (rRNA) and proteins. Protein Synthesis Factors a. Transcription Factors RNA Polymerase: Synthesizes mRNA from DNA. c. Elongation Factors Eukaryotic Elongation Factors (eEFs): Facilitate the addition of amino acids (e.g., eEF1, eEF2). Prokaryotic Elongation Factors (EFs): Equivalent factors in prokaryotes (e.g., EF-Tu, EF-G). Post-Transcriptional and Translational Modulators Splicing Factors: Process mRNA in eukaryotes to remove introns. Several factors are essential for the process, categorized into initiation, elongation, and termination stages: 1. d. Termination Factors Release Factors (RFs): Recognize stop codons and release the newly formed protein. Enzymes: Aminoacyl-tRNA synthetases attach amino acids to tRNA. MicroRNAs (miRNAs): Regulate translation by binding to mRNA. tRNA (Transfer RNA): Brings amino acids to the ribosome. 2. 3. 4