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