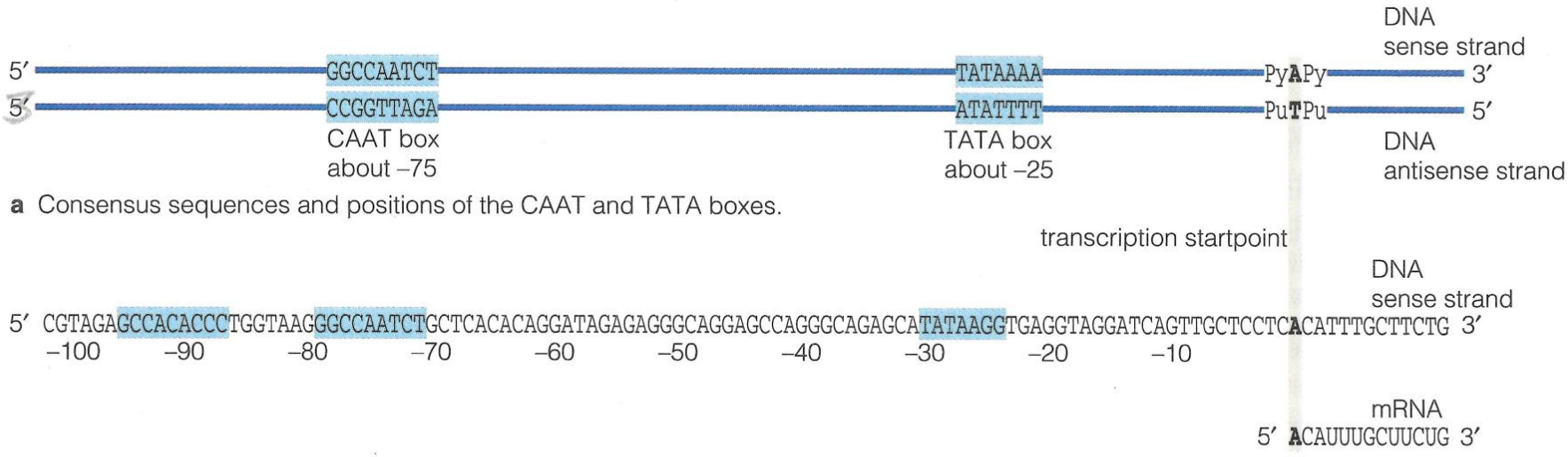
Transcription in Eukaryotes

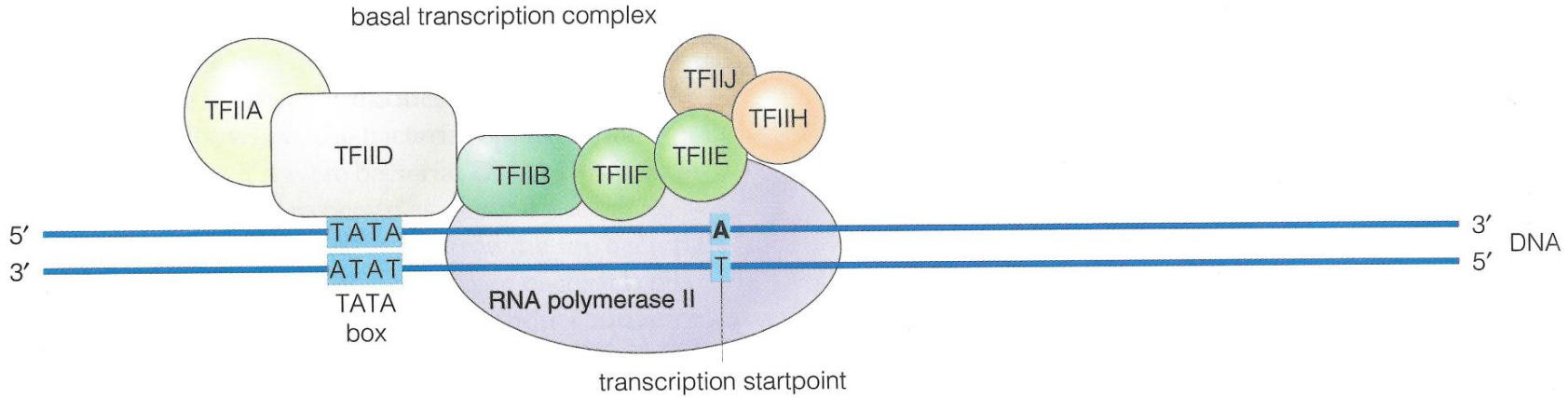


a Consensus sequences and positions of the CAAT and TATA boxes.

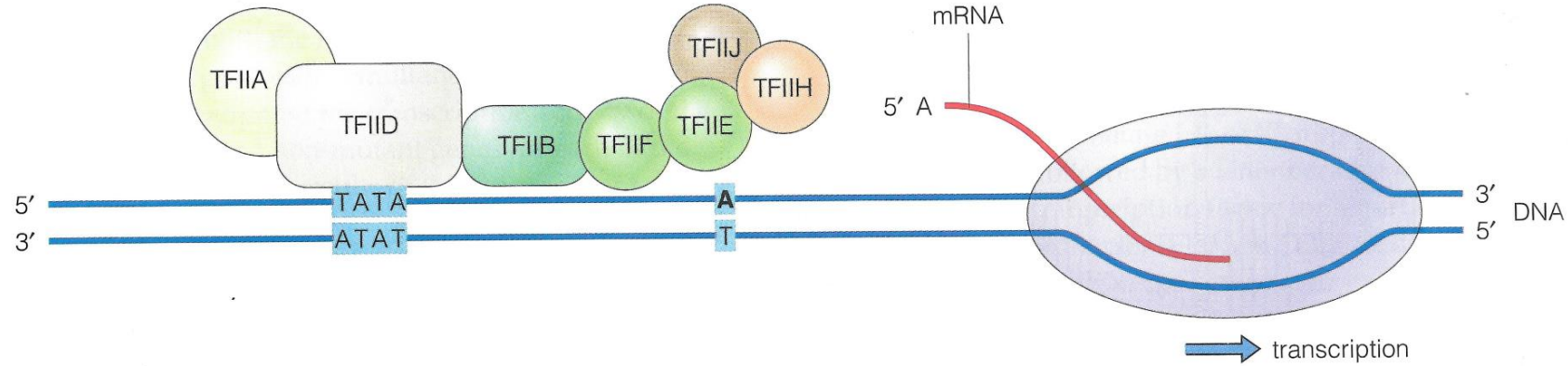
b DNA sequence of the mouse β-major globin gene promoter region. Conserved sequences are shaded in blue.

Figure 3.8 Conserved sequences in eukaryotic promoters.

Initiation and Elongation of Transcription in Eukaryotes



a The basal transcription complex positions RNA polymerase II for initiation of transcription.



b Once transcription is initiated, RNA polymerase II separates from the basal transcription complex and proceeds to transcribe the gene.

Figure 3.10 The basal eukaryotic transcription complex and initiation of transcription in eukaryotes.

Initiation and Elongation of Transcription in Eukaryotes

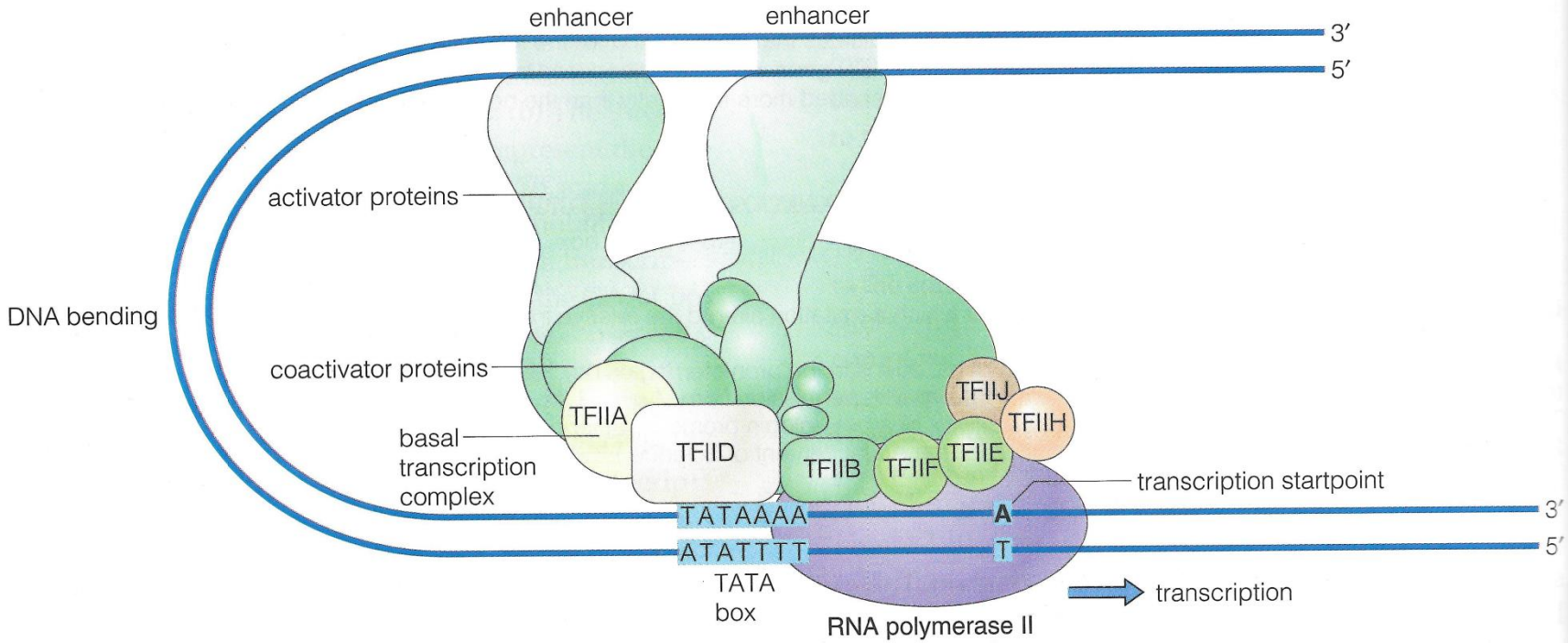


Figure 3.11 Interaction of enhancers, activators, and coactivators with the basal transcription complex for initiation of transcription in eukaryotes. The DNA bends, bringing the activator proteins into contact with coactivator proteins bound to the basal transcription complex. (Adapted from an original drawing by Jared Schneidman Design in Tijan, R. 1995. Molecular machines that control genes. *Scientific American* 272 (Feb 95):54–61. Reprinted by permission.)

Initiation and Elongation of Transcription in Eukaryotes

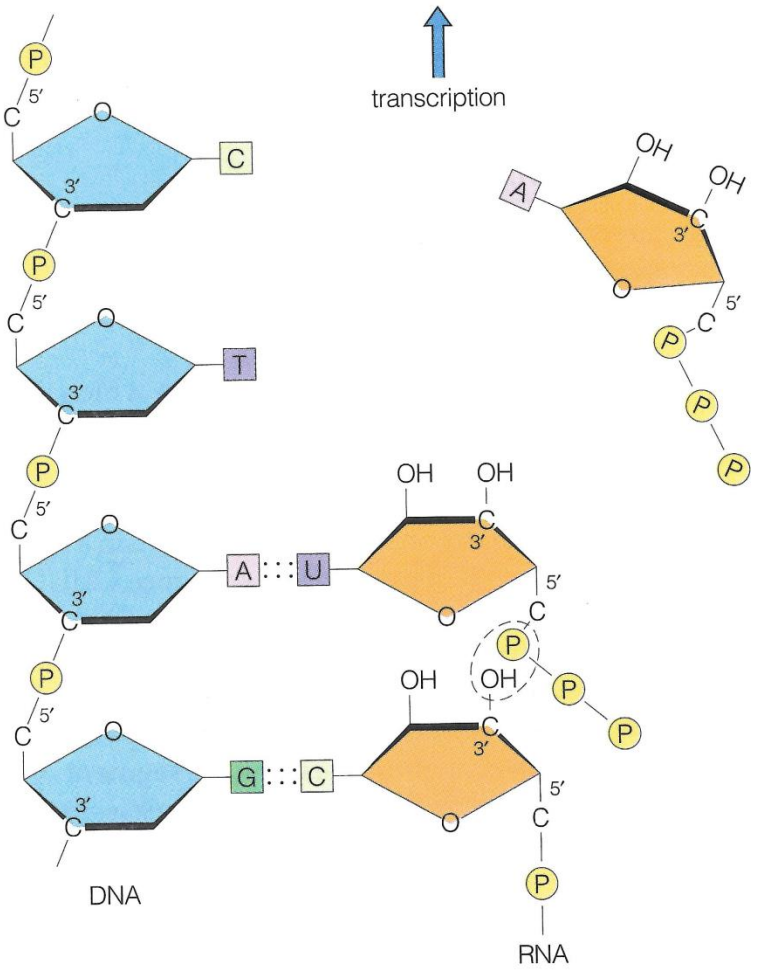
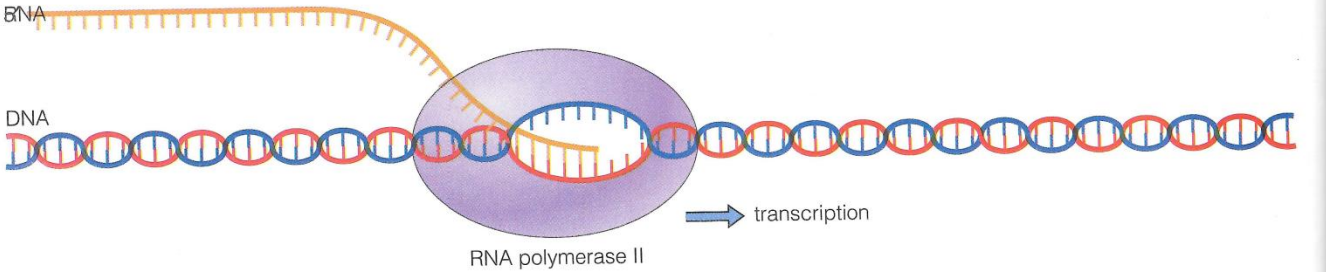
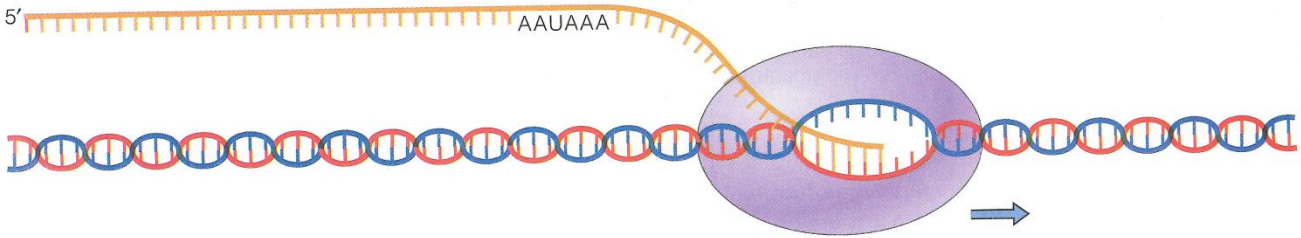


Figure 3.12 Energy for transcription. Cleavage of two phosphate groups from the ribonucleotide triphosphate releases energy.

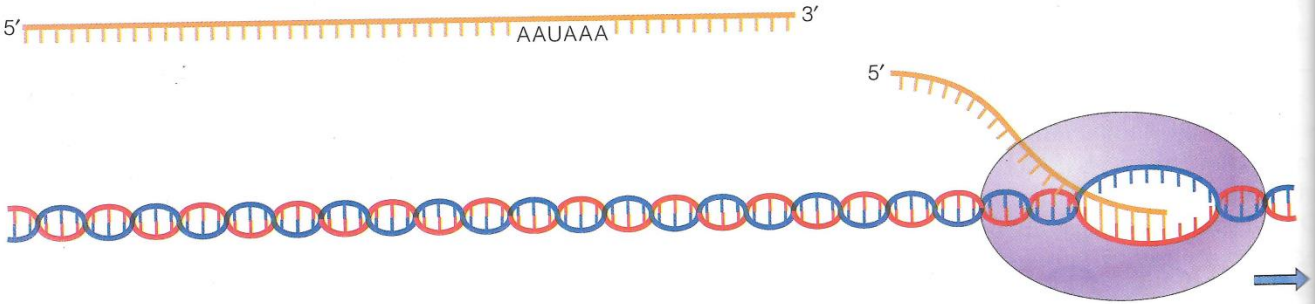
Termination of Transcription in Eukaryotes



a Transcription during elongation



b Transcription of the AAUAAA conserved sequence



c Cleavage of the mRNA: mRNA is cleaved 11–30 nucleotides downstream from the AAUAAA sequence.

Figure 3.15 RNA cleavage that precedes termination of transcription by RNA polymerase II in eukaryotes.

Transcription in Eukaryotes

TABLE 11-3 PROPERTIES AND FUNCTIONS OF EUKARYOTIC RNA POLYMERASES

Enzyme	Localization	Gene Transcripts	Inhibition by α-Amanitin
I	Nucleolus	18S and 28S rRNAs	Insensitive
II	Nucleoplasm	mRNA	Sensitive to low concentration
III	Nucleoplasm	tRNA, 5S RNA	Sensitive to high concentration