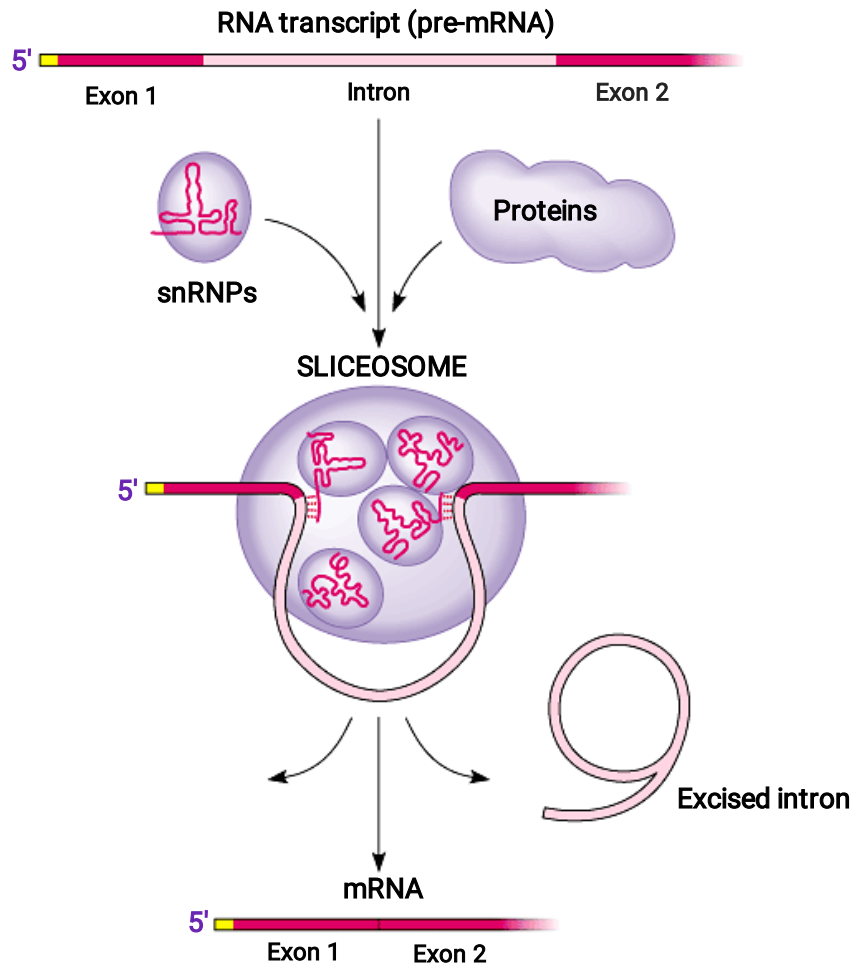


- (p.306)37. On the figure below, label the following: pre-mRNA, snRNPs, snRNA, protein, spliceosomes, intron, excised intron, other proteins and mRNA.



- (p.312)38. What is a ribozyme?

Ribozymes are RNA molecules that function as enzymes.

- (p.313)39. What commonly held idea was rendered obsolete by the discovery of ribozymes?

The commonly held idea that was rendered obsolete by the discovery of ribozymes was that "All biological catalysts are proteins."

- (p.313)40. What is the function of tRNA?

The function of tRNA is to transfer amino acids from the cytoplasm's amino acid pool to the ribosome (*protein factory*).

- (p.314)41. What is an anticodon?

An anticodon is the nucleotide triplet found on tRNA which base-pairs with a complimentary codon on mRNA.

(p.315)42. Transfer RNA (tRNA) has two attachment sites. What binds at each site?

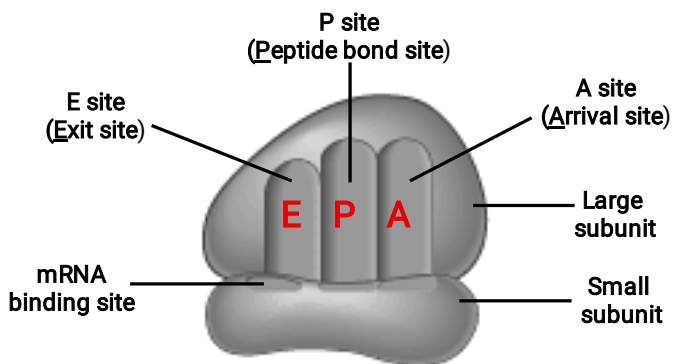
An amino acid binds at the 3' site.

(p.315)43. How many different aminoacyl-tRNA synthetases are there? 20

(p.317)44. How does a prokaryotic ribosome differ from a eukaryotic ribosome? What is the medical significance of this difference?

Eukaryotic ribosomes are slightly larger than prokaryotic ribosomes. Medically speaking, prokaryotic ribosomes are paralyzed by certain antibiotics while eukaryotic ribosomes are not.

(p.316)45. On the diagram below, label the large subunit, small subunit, A, P, and E sites, mRNA binding site. To the right of the figure, explain the functions of the A, P, and E sites [Translation Animation](#)



A site - holds the tRNA carrying the next amino acid to be added to the growing polypeptide chain.

P site - holds the tRNA carrying the growing polypeptide chain.

E site - discharged tRNAs leave the ribosome from this site.

(p.317-18)46. Much like transcription, we can divide translation into three stages. Briefly describe each stage. ([Animation](#))

(1) **Initiation** – Brings together mRNA, a tRNA bearing the first amino acid of the polypeptide, and the two subunits (large and small) of the ribosome. Initiation factors and GTP (energy source) are required to form the *initiation complex*.

(2) **Elongation** – The addition of amino acids one at a time to the growing polypeptide chain. Elongation is a three-step process:
(1) Codon Recognition (2) Peptide bond formation (3) Translocation

(3) **Termination** – Translations is over when a STOP CODON binds to the A-site.