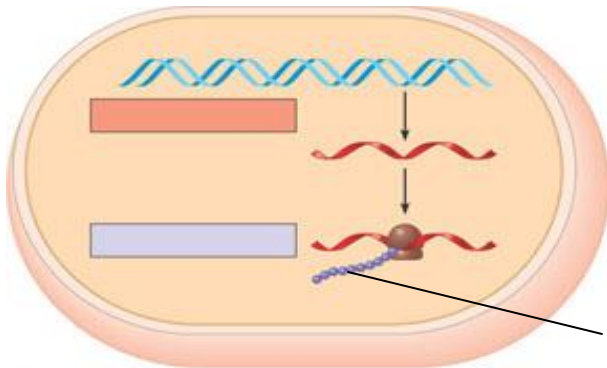


AP Biology
 TEXT: *Biology, Campbell and Reece*
 7th Edition

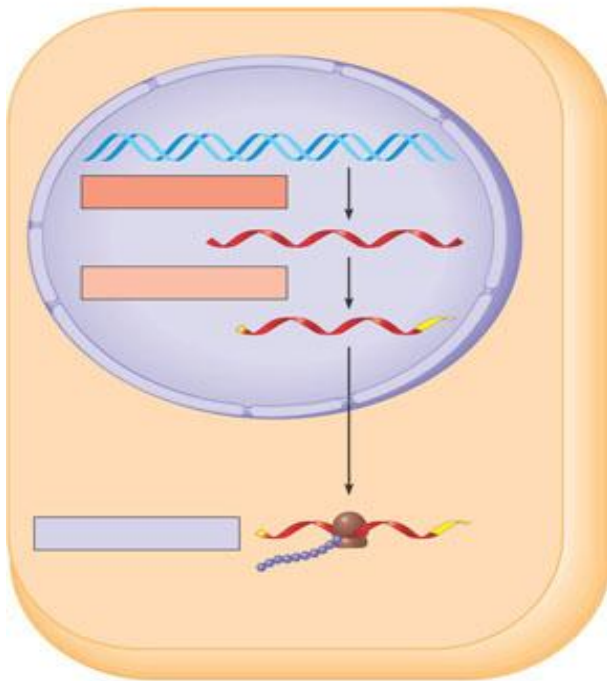
Chapter 17 – From Gene to Protein
 Guided Reading

1. Use Figure 17.3 below to note the flow of genetic information in a eukaryotic cell.
Completely label each diagram with the appropriate term and provide the definition.



(a)

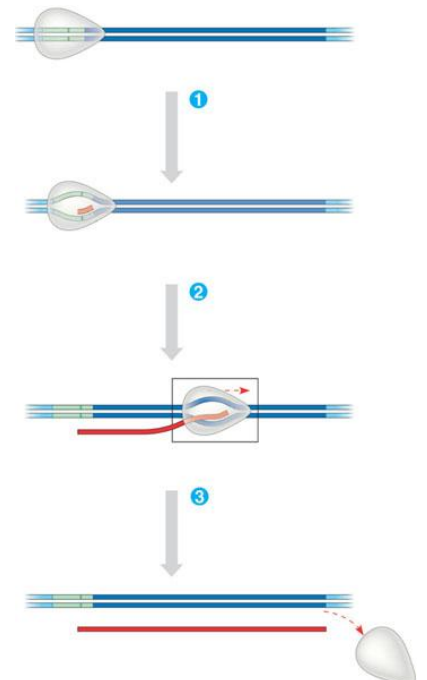
polypeptide - a polymer (chain) of many amino acids linked together by peptide bonds.



(b)

2. Why must the “*code of life*” exist in triplets and not singles or doubles?

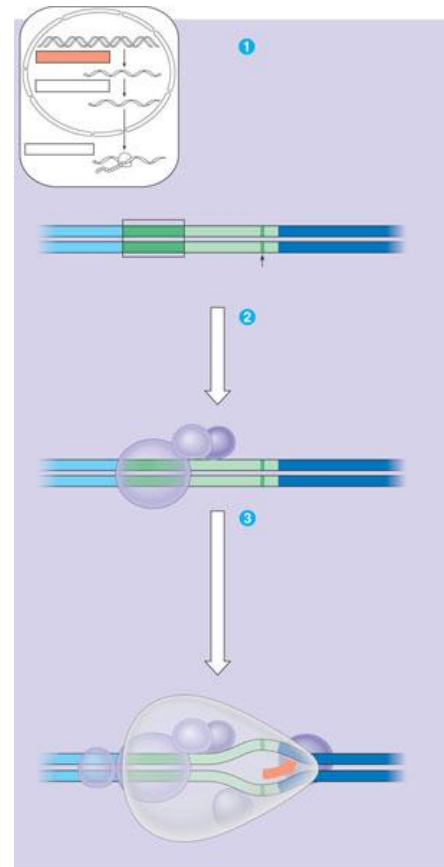
3. What is the template strand?
4. Compare and contrast the codon and the anticodon?
5. How did Nirenberg determine that codons specify which amino acid will be added to the elongating polypeptide chain?
6. Explain the *reading frame*?
7. What conclusions can be drawn from the alarming similarities of the genetic code among living organisms?
8. Use Figure 17.7 below to support your explanation of transcription (**Use your own words**). Define all terms used to label the diagram.



9. Describe the prokaryotic promoter and terminator.

10. What is a **transcription unit**?

11. Use Figure 17.8 to demonstrate initiation of transcription at a eukaryotic promoter. Write the definition of each term used to label the diagram.



12. Contrast termination of transcription for prokaryotic versus eukaryotic organisms.

13. Why is important that the promoter be upstream of the transcription unit?

14. Why is RNA processing necessary?

15. What does adding a **5' cap** and **poly-A tail** mean and why is it important?

16. Define the following terms:

a. RNA splicing

b. introns

c. exons

d. spliceosome

e. snRNP's

f. ribozymes

g. UTR

h. alternative RNA splicing

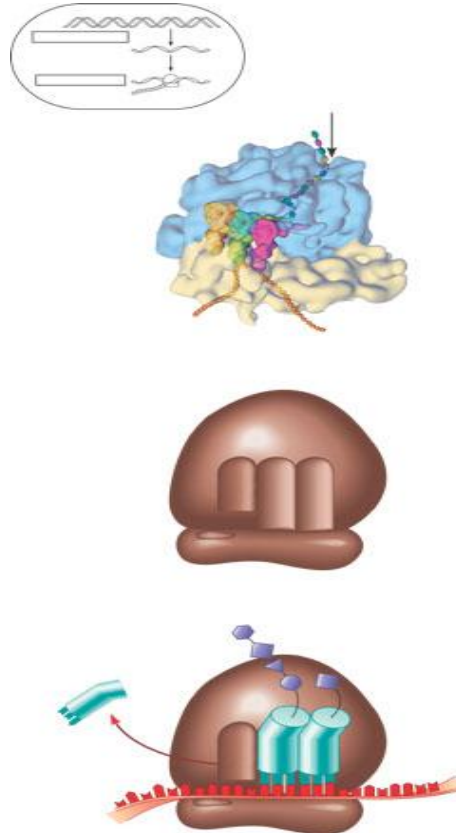
i. domains

17. Describe the structure and function of transfer RNA, also referred to as tRNA.

18. Why is the enzyme, **aminoacyl-tRNA synthetase** important to translation and protein synthesis?

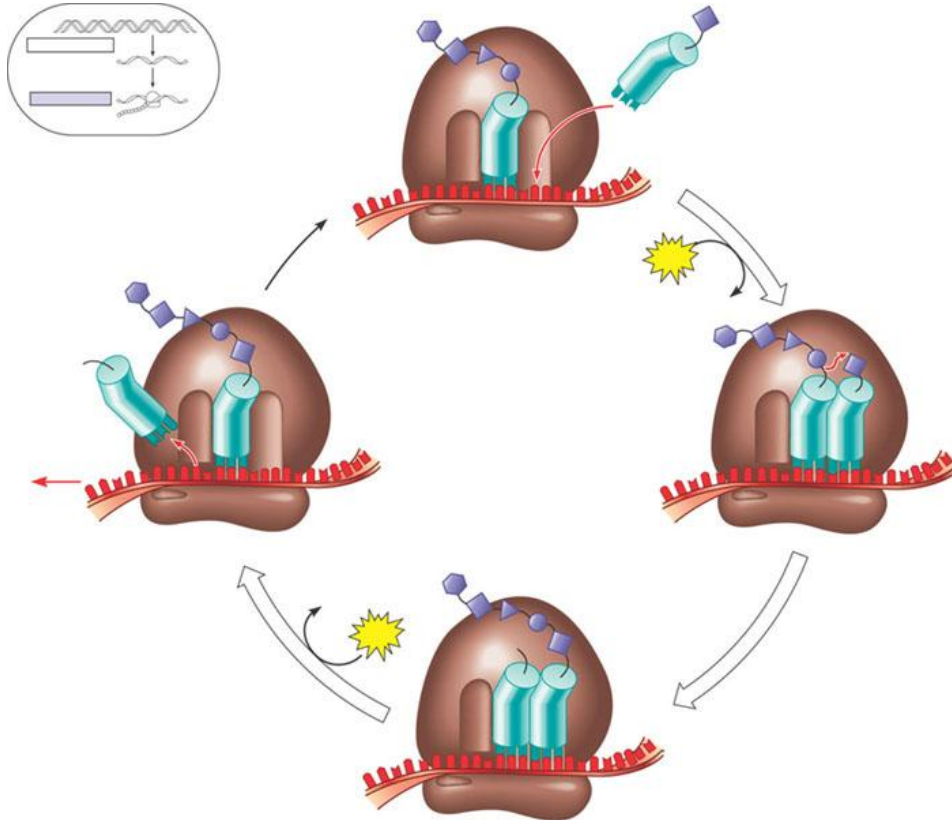
19. What is “wobble”?

20. Describe the structure and function of ribosomal RNA or rRNA – Use Figure 17.16 diagram below.

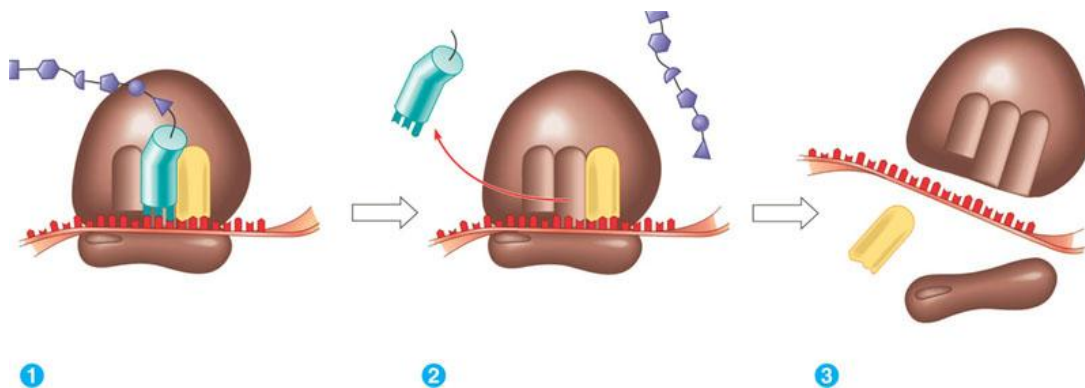


21. *Summarize* the steps of the initiation of translation.

22. Use Figure 17.18 below to detail the elongation cycle of translation. Define terms used to label the diagram.



23. Use the diagram below to detail the termination of translation – Define all terms.



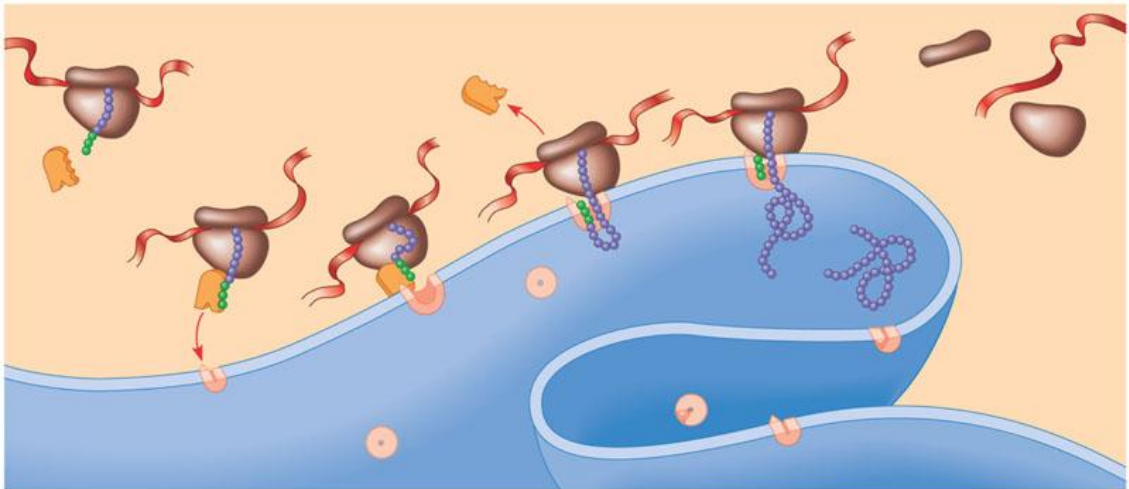
24. What are **polyribosomes** (or **polysomes**)?

25. What is an example of a “*post translational modification*” of a protein?

26. What is a signal peptide?

27. What is a signal recognition particle (SRP)?

28. Use Figure 17.21 below to highlight the signal mechanism for targeting proteins to the endoplasmic reticulum or ER.



29. Define the following terms:

a. mutation

b. point mutation

c. base pair substitution

d. missense

e. nonsense

f. insertion

g. deletion

h. frameshift mutation

i. mutagen

30. Use Figure 17.26 below to help you reflect on the “whole” picture of going from gene to protein to YOU!!! See if you can label the diagrams empty boxes with the correct terms and compose a summary without using the textbook or referring to previous questions in your reading guide.

