2.10. Contrast DNA and RNA. Cite at least four differences.

2.11. Contrast the advantages and disadvantages of chemically defined and complex media.

2.12. You are asked to develop a medium for production of an antibiotic. The antibiotic is to be made in large amounts (ten 100,000 l fermenters) and is relatively inexpensive. The host cell is a soil isolate of a fungal species, and the nutritional requirements for rapid growth are uncertain. Will you try to develop a defined or complex medium? Why?

2.13. You wish to produce a high-value protein using recombinant DNA technology. Would you try to develop a chemical defined medium or a complex medium? Why?

2.14. Explain what semiconservative replication means.

2.15. Give characteristic dimensions for each of these organisms:

E. coli
Yeast (S. cerevisiae)
Liver cell (hepatocyte)
Plant cell

2.16. What are the differences in cell envelope structure between gram-negative and gram-positive bacteria? These differences become important if you wish to genetically engineer bacteria to excrete proteins into the extracellular fluid.

2.17. True or False

a) An organism that can grow using oxygen as an electron acceptor and can also grow and metabolize in the absence of oxygen is called facultative.

b) Yeasts are procaryotes.

c) A bacteriophage is a virus that infects bacteria.

d) When you supplement growth medium with amino acids, you should use the D-form.