Murray: Medical Microbiology, 6th Edition

Chapter 02: Bacterial Classification, Structure, and Replication

Test Bank

MULTIPLE CHOICE

1. Teichoic acids, mycolic acids, peptidoglycan, and disaccharide-pentapeptide subunits are all building blocks of which bacterial structure?
   a. Outer cell membrane
   b. Flagella
   c. Inner cell membrane
   d. Cell wall

   ANS: D

2. What is the major difference between the cell walls of gram-positive and gram-negative bacteria?
   a. The peptidoglycan layer in gram-positive bacteria is substantially thicker.
   b. The cell wall of gram-positive bacteria contains mycolic acids.
   c. Gram-positive bacteria contain a cytoplasmic membrane.
   d. Gram-positive bacteria may have a polysaccharide capsule as a covering.
   e. Gram-negative bacterial membranes contain ergosterol

   ANS: A

3. Which of the following distinguishes a bacterium from a eukaryote?
   a. Translation of the mRNA by the ribosome
   b. Phospholipid bilayer structure of the membranes
   c. ATP production from membrane potential at plasma membrane
   d. Semiconservative replication of chromosome
   e. Sensitivity to folate analogue antimetabolites

   ANS: C

4. Which reason explains why gram-positive bacteria are stain positive?
   a. Bacteria reduce the stain to produce the characteristic color.
   b. Cell wall traps the stain.
   c. Acetone treatment precipitates intracellular stain.
   d. Heat fixing uncovers stainable proteins.
   e. Outer membrane absorbs the stain.

   ANS: B
5. Which of the following does not occur in eukaryotes?
   a. Start of protein synthesis with AUG codon
   b. Coupling of ATP production to membrane potential
   c. Coupling of transcription and translation
   d. Movement by flagella
   e. Transformation of cells with foreign DNA

   ANS: C

6. Which of the following is not synthesized by prokaryotes?
   a. C\textsubscript{55} isoprenoid phosphate
   b. Cardiolipin
   c. Cholesterol
   d. F\textsubscript{i} ATPase
   e. Phosphatidylcholine

   ANS: C

7. Which of the following is present in gram-positive bacteria but not in gram-negative bacteria?
   a. D-Ala D-Ala carboxypeptidase
   b. F\textsubscript{i} ATPase
   c. Flagellin
   d. Lipoteichoic acid
   e. Lysozyme

   ANS: D

8. Why are gram-negative bacteria insensitive to lysozyme?
   a. Lysozyme does not traverse porins.
   b. The O antigen is an inhibitor of the enzyme.
   c. The D-Ala D-Ala transpeptidase is insensitive to lysozyme.
   d. The target structure regenerates quickly.
   e. They lack a peptidoglycan.

   ANS: A

9. After growth of \textit{E. coli} obtained from a urinary tract infection in the laboratory, the bacteria became attenuated for urinary tract infections. Mutation in a gene for which of the following would cause the attenuation?
   a. Flagellin
   b. Lipopolysaccharide
   c. Lipoteichoic acid
   d. M protein
   e. Pilin

   ANS: E

10. Between which structures does lysozyme cleave?
a. Terminal D-Ala D-Ala residues
b. Glycine connecting bridge and the lysine in the third peptide position
c. Lipid A and the core polysaccharide
d. N-acetylglycosamine and the N-acetylmuramic acid
e. Terminal D-Ala D-Ala and the lysine in the third position

ANS: D

11. What alteration in the structure of lipopolysaccharide results from bacitracin inhibition of bactoprenol?
   a. Inhibition of lipid A synthesis
   b. Lack of O antigen
   c. Localization of LPS at adhesion sites
   d. Longer core polysaccharide
   e. Shorter core polysaccharide

ANS: B

12. Growing *E. coli* bacteria transferred from rich medium to a buffer containing no nutrients will:
   a. Lyse
   b. Activate fMet-initiated protein synthesis
   c. Trigger initiation of sporulation
   d. Continue DNA replication
   e. Convert from aerobic to anaerobic metabolism

ANS: D