

CHAPTER 27 BACTERIA AND ARCHAEA

Learning objectives

Structural and Functional Adaptations Contribute to Prokaryotic Success

1. Explain why it might be said that the history of life on Earth is one long “age of prokaryotes”.
2. Describe the structure, composition, and functions of prokaryotic cell walls.
3. Distinguish between the structure and staining properties of gram-positive and gram-negative bacteria.
4. Describe how prokaryotes carry out photosynthesis and cellular respiration when they lack compartmentalized organelles such as chloroplasts and mitochondria.
5. Explain why prokaryotes are unable to grow in very salty or sugary foods, such as cured meats or jam.
6. State the function(s) of each of the following prokaryotic features:
 - a. capsule
 - b. fimbriae
 - c. sex pilus
 - d. nucleoid
 - e. plasmid
 - f. endospore
7. List three factors that give rise to high levels of genetic diversity in prokaryotes.
8. Describe three processes that produce recombinant DNA in prokaryotes.
9. Explain how R plasmids confer antibiotic resistance on bacteria.

Nutritional and Metabolic Diversity of Prokaryotes

10. Distinguish, with prokaryotic examples, among photoautotrophs, chemoautotrophs, photoheterotrophs, and chemoheterotrophs.
11. Distinguish among obligate aerobes, facultative anaerobes, and obligate anaerobes.