

Prokaryotes

1. _____ are the oldest, structurally simplest, and the most abundant forms of life on earth.
2. As a group, prokaryotes exhibit a great deal of _____ in terms of both structure and metabolism.
3. Prokaryotes split into two lines early in the history of life. The differences are so fundamental that they are assigned to two different domains, the _____ and the bacteria.
4. Genetic diversity in bacteria is influenced by mutation and _____.
5. Some species of prokaryotes play a vital role both in productivity and in nutrient _____, providing substances essential to all other life forms.
6. Bacterial cell walls usually consist of _____, a network of polysaccharide molecules connected by polypeptide cross-links.
7. Most bacteria that cause plant diseases are members of the group of rod-shaped bacteria known as _____.
8. Members of the genus _____ are associated with scarlet fever, rheumatic fever, pneumonia, etc.
9. In addition to viruses, such as HIV, a number of species of _____ also cause sexually transmitted diseases.
10. Personal care products such as _____ will likely lead to bacteria immune to those antibiotics.
11. Current classification of prokaryotes is based on
 - A. morphology of flagella
 - B. sequencing of proteins, DNA and RNA
 - C. occurrence of transverse binary fission
 - D. type of colony formation
 - E. ability to stain the cell wall with Gram stain
12. When bacteria are exposed to nutrient-poor conditions, they form thick-walled structures that contain the chromosome and a small amount of cytoplasm. These structures are called
 - A. plasmids
 - B. pseudomonads
 - C. nucleoids
 - D. endospores
 - E. xospores

13. Certain bacteria are the only organisms that are capable of fixing atmospheric
 - A. carbon dioxide
 - B. oxygen
 - C. hydrogen
 - D. carbon
 - E. nitrogen
14. Prokaryotes undergo a process that produces cells that are identical. This process is called
 - A. mitosis
 - B. meiosis
 - C. conjugation
 - D. binary fission
 - E. syngamy
15. The prokaryotic DNA is located in the
 - A. capsid region
 - B. nucleoid region
 - C. endospore region
 - D. peptidoglycan region
 - E. pili region
16. Which of the following is a characteristic of prokaryotes?
 - A. found in every habitat
 - B. metabolically versatile
 - C. contain enormous adaptability
 - D. a and b
 - E. a, b, and c
17. Prokaryotes are very important ecologically because they perform all of the following except
 - A. carry out photosynthesis
 - B. fix atmospheric nitrogen
 - C. carry out decomposition
 - D. all capable of causing diseases
 - E. inhabit all types of habitats
18. Which of the following is not used in the classification of prokaryotes?
 - A. ability to photosynthesize
 - B. infectivity
 - C. motility
 - D. unicellularity
 - E. sporulation or binary fission

19. Which of the following is not true about prokaryotes?
- A. They are the oldest organisms on earth.
 - B. They are the structurally simplest organisms.
 - C. They are the most abundant life forms on earth.
 - D. They contain organelles.
 - E. They are found in fossils that are 3.0-3.5 billion years old.
20. Genetic engineering technology is being applied to adapt *Bacillus thuringiensis* for the purpose of
- A. antibiotic production
 - B. cheese manufacture
 - C. insect control
 - D. making human proteins
 - E. toxic waste degradation
21. In all of the following characteristics, prokaryotes differ from eukaryotes except in
- A. cell size
 - B. multicellularity
 - C. chromosomes
 - D. plasma membrane
 - E. organelles
22. In which of the following characteristics, prokaryotes and eukaryotes are similar?
- A. cell division
 - B. internal compartmentalization
 - C. flagella
 - D. contain ribosomes
 - E. enzymes localized in the plasma membrane
23. Which of the following is not a shape seen in prokaryotes?
- A. cocci
 - B. bacilli
 - C. spirals
 - D. helicals
 - E. icosahedrals
24. Prokaryotic cell walls consist of a network of polysaccharide molecules connected by cross-links of
- A. other polysaccharides
 - B. lipids
 - C. polypeptides
 - D. ribosomes
 - E. chromosomal DNA

25. Certain prokaryotes can withstand drying and hotter temperatures because of their ability to form
- A. cell walls
 - B. endospores
 - C. flagella
 - D. organelles
 - E. plasmids
26. In some bacteria, a capsule surrounds the cell wall. It is made up of
- A. a lipopolysaccharide
 - B. peptidoglycan
 - C. gelatin
 - D. pili
 - E. glycoprotein
27. Bacterial ribosomes differ from eukaryotic ribosomes in all of the following except
- A. act as sites of protein synthesis
 - B. smaller than in eukaryotes
 - C. tetracycline and chloramphenicol can bind to bacterial ribosomes
 - D. differ in ribosomal proteins
 - E. differ in RNA content
28. Archaeobacteria differ from bacteria in which of the following?
- A. cell wall
 - B. plasma membrane make up
 - C. gene translation machinery
 - D. gene architecture
 - E. all of the above
29. The *E. coli* bacterium has about
- A. 5000 genes
 - B. 500 genes
 - C. 50 genes
 - D. 5 genes
 - E. none of the above
30. The two most common processes creating prokaryotic genetic diversity are
- A. mutation
 - B. recombination
 - C. transformation
 - D. a and b
 - E. a and c

31. Heterotrophs that harvest energy from organic molecules are called
- A. photoautotrophs
 - B. chemoautotrophs
 - C. photoheterotrophs
 - D. chemoheterotrophs
 - E. nitrogen fixers
32. Some prokaryotes attach to other substrates by hairlike outgrowths, which are shorter than flagella. These are called
- A. endospores
 - B. flagellin
 - C. pili
 - D. plasmids
 - E. fission products
33. Bacteria cause all of the following human diseases except
- A. cholera
 - B. diphtheria
 - C. mononucleosis
 - D. tetanus
 - E. malaria
34. Dental plaque, a first stage in tooth decay, consists of
- A. sugars
 - B. bacteria surrounded by a polysaccharide matrix
 - C. fluoride
 - D. lactic acid
 - E. the pH of the mouth
35. Sexually transmitted diseases include which of the following?
- A. gonorrhea
 - B. syphilis
 - C. chlamydia
 - D. a, b, and c
 - E. a and b
36. Gonorrhea and syphilis are most commonly controlled by
- A. abstinence
 - B. antibiotics
 - C. boiling water
 - D. fluoride treatment
 - E. pasteurization

37. Four of the five choices are characteristics of prokaryotic organisms. Select the exception.
- A. Most prokaryotic cell diameters are one micrometer or less.
 - B. Most prokaryotic organisms are unicellular.
 - C. Prokaryotic organisms use mitosis for their nuclear division.
 - D. Prokaryotic organisms use binary fission to divide.
 - E. Prokaryotic organisms do not have a membrane around their nuclear materials.
38. The enzymes for cellular respiration in eukaryotic organisms are located within the mitochondria. In prokaryotic organisms, these enzymes are attached to the
- A. cell wall
 - B. cell membrane
 - C. ribosomes
 - D. circular DNA
 - E. nuclear membrane
39. A microbiologist is investigating the effects of cold on a particular bacterium. He notices that as the temperature approaches zero degrees Centigrade, that the bacteria begin to
- A. form more pili
 - B. produce thicker cell membranes
 - C. secrete more peptidoglycans
 - D. form endospores
 - E. secrete lipopolysaccharides from their thicker cell membranes
40. A microbiologist explains to one of her biology classes that her research is in the nucleoid region of the cholera bacteria. This means that she is studying
- A. a region within the cholera bacterium's nucleus
 - B. a region within the cholera bacterium's nuclear membrane
 - C. a region within the cholera bacterium's cell that contains the single double-stranded ring of DNA
 - D. a region within the cholera bacterium's cell that is close to the plasmids
41. Which of the following differences between Archaeobacteria and Bacteria is correct?
- A. Archaeobacteria have peptidoglycans in their cell walls. Bacteria do not have peptidoglycans in their cell walls.
 - B. Archaeobacteria and Bacteria have different lipids in their bilipid layer of the plasma membranes.
 - C. Archaeobacteria and Bacteria have ribosomal proteins and an RNA polymerase that are distinctly different from eukaryotes, however bacteria ribosomal proteins are different from eukaryotes, while Archaeobacteria ribosomal proteins are very similar.
 - D. Genes of most Archaeobacteria are not interrupted by introns, whereas interns interrupt bacteria genes.

42. Prokaryotes reproduce rapidly and this allows genetic variation to spread quickly through a population. Two processes can create variations in prokaryotic populations. Select the choice with those two processes.
- A. mutation and phage viral attack
 - B. phage viral attack and genetic recombination
 - C. genetic recombination and nondisjunction
 - D. genetic recombination and mutation
 - E. genetic recombination and rapid cell division
43. Tuberculosis remains a serious world-wide health problem due to
- A. multi-drug resistance
 - B. social factors such as crowding and incarceration
 - C. the prevalence of HIV infections
 - D. ease of transmission
 - E. all of the above
44. A microbiologist is conducting a research project on chemoautotrophs. This means that the investigator is examining certain aspects of a bacterium that
- A. can oxidize sulfur
 - B. is a purple non-sulfur bacteria which depends on light
 - C. obtains carbon from organic molecules
 - D. can use the energy from sunlight to build organic molecules from carbon dioxide
45. *Streptococcus sanguis* is one of the bacteria that can cause the loss of tooth enamel in humans. The metabolic process that this particular species of bacteria uses that can result in enamel breakdown is
- A. *Streptococcus sanguis*, which can ferment sugar into lactic acid, which increases the pH of the mouth causing loss of calcium from the enamel of the teeth.
 - B. *Streptococcus sanguis*, which can ferment sugar into lactic acid, which decreases the pH of the mouth causing loss of calcium from the enamel of the teeth.
 - C. *Streptococcus sanguis*, which can ferment sugar into lactic acid that attacks the tooth enamel directly and causes dental carries.
 - D. *Streptococcus sanguis*, which can ferment sugar into lactic acid, which decreases the amount of calcium that can be absorbed by the teeth from the diet.
46. If left untreated, syphilis infections go through four stages. The first stage is a sore called a chancre. The signs of the second stage are
- A. some nerve damage, loss of some teeth, and perhaps a dimming of color vision
 - B. very few, with many victims having no symptoms
 - C. rashes that may cover the entire body, sometimes a sore throat, and general aches and pains that appear to be flu-like
 - D. persistence of the chancre and bleeding at the chancre site
 - E. a yellowish-white discharge from the urethra

47. *Chlamydia trachomatis* causes an STD in humans. Four of the five statements about *Chlamydia trachomatis* are true. Select the exception.
- A. *Chlamydia trachomatis* is called the “silent STD.”
 - B. *Chlamydia trachomatis* can cause sterility.
 - C. *Chlamydia trachomatis* can be treated with some antibiotics.
 - D. *Chlamydia trachomatis* depends on a host cell for replication.
 - E. *Chlamydia trachomatis*, although a sexual transmitted disease, has no clear link to PID.

Answer Key

No. on Test	Correct Answer
1	Prokaryotes
2	diversity
3	Archaeobacteria
4	recombination
5	cycling
6	peptidoglycan
7	pseudomonads
8	Streptococcus
9	bacteria
10	antibacterial soap
11	B
12	D
13	E
14	D
15	B
16	E
17	D
18	B
19	D
20	C
21	D
22	D
23	E
24	C
25	B
26	C
27	C
28	E
29	A
30	D
31	D
32	C
33	E
34	B
35	D
36	B
37	C
38	B
39	D
40	C
41	D
42	D

