

# Advanced Microbiology Challenge

Microbiology · Practice Test · 18 Questions

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**1. Which bacterial structure, composed of polysaccharides or polypeptides, specifically serves to protect the pathogen from phagocytosis?**

- A) Capsule
- B) Pilus
- C) Mesosome
- D) Flagellum

**2. During the process of bacterial conjugation, which genetic element is transferred from the donor to the recipient cell?**

- A) Capsid
- B) Plasmid
- C) Ribosome
- D) Centriole

**3. What is the primary component of the cell wall in most Fungi, distinguishing them from the peptidoglycan-based walls of bacteria?**

- A) Cellulose
- B) Lignin
- C) Chitin
- D) Pectin

**4. Which phase of the bacterial growth curve is characterized by no net increase in population size because the rate of cell division equals the rate of cell death?**

- A) Lag phase
- B) Log phase
- C) Stationary phase
- D) Decline phase

**5. Viruses that exclusively infect bacteria are known as what?**

- A) Bacteriophages
- B) Retroviruses
- C) Viroids
- D) Prions

**6. Which staining technique is used to identify bacteria with high concentrations of mycolic acid in their cell walls, such as *Mycobacterium tuberculosis*?**

- A) Gram stain
- B) Acid-fast stain
- C) Endospore stain
- D) Negative stain

**7. What term describes a microorganism that requires high concentrations of salt to survive and thrive?**

- A) Thermophile
- B) Barophile
- C) Halophile
- D) Acidophile

**8. In viral replication, what is the term for the process where a virus integrates its genetic material into the host cell's genome without immediately causing cell death?**

- A) Lytic cycle
- B) Lysogenic cycle
- C) Binary fission
- D) Transformation

**9. Which organelle do eukaryotic microbes possess that is entirely absent in prokaryotic organisms?**

- A) Ribosome
- B) Cytoplasm
- C) Mitochondrion
- D) Plasma membrane

**10. What is the main function of the bacterial endospore?**

- A) Reproduction
- B) Photosynthesis
- C) Survival in extreme conditions
- D) Motility

**11. Which group of microorganisms is responsible for the process of nitrogen fixation in root nodules of leguminous plants?**

- A) *Rhizobium*
- B) *Streptococcus*
- C) *Candida*
- D) Influenza

**12. What is the defining characteristic of a 'facultative anaerobe'?**

- A) It requires oxygen to survive
- B) It dies in the presence of oxygen
- C) It can grow with or without oxygen
- D) It strictly uses fermentation

**13. Which biochemical pathway do yeast perform in the absence of oxygen to produce ethanol and carbon dioxide?**

- A) Krebs cycle
- B) Fermentation
- C) Electron transport chain
- D) Glycolysis

**14. The study of the interactions between microbes and the human immune system is known as what?**

- A) Mycology
- B) Immunology
- C) Phycology
- D) Parasitology

**15. Which enzyme, found in tears and saliva, breaks down the peptidoglycan layer of bacterial cell walls?**

- A) Amylase
- B) Pepsin
- C) Lysozyme
- D) Lipase

**16. What is the primary mode of genetic variation in bacteria that involves the uptake of 'naked' DNA from the surrounding environment?**

- A) Transduction
- B) Conjugation
- C) Transformation
- D) Mutation

**17. Which microbial structure is responsible for bacterial motility and is composed of the protein flagellin?**

- A) Cilia
- B) Flagellum
- C) Fimbriae
- D) Capsid

**18. What are infectious protein particles that lack nucleic acids and are responsible for diseases like Creutzfeldt-Jakob disease?**

- A) Viroids
- B) Prions
- C) Plasmids
- D) Capsomeres