

# Microbe Mission

Two types of microbes were grown in nutrient agar on the petri plates shown in Figures 1 and 2.

*S.epidermidis* is a type of bacteria and *C.albicans* is a type of fungus. Four filter paper discs were applied to the plates. Three of the four discs were treated with chemicals and one disc was left untreated as a control. The zone of inhibition around each disc was measured in millimeters (mm).

Figure 1  
*S.epidermidis*

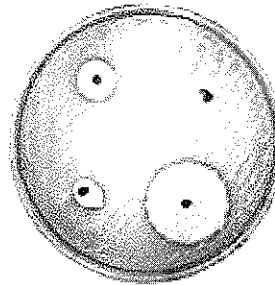
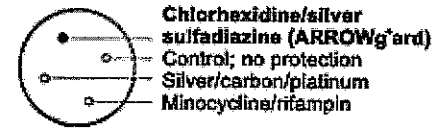
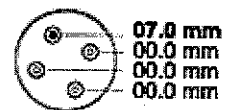
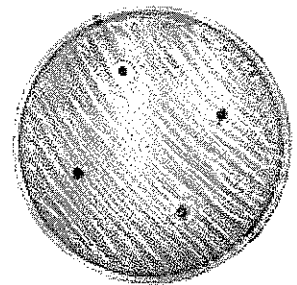


Figure 2  
*C. albicans*

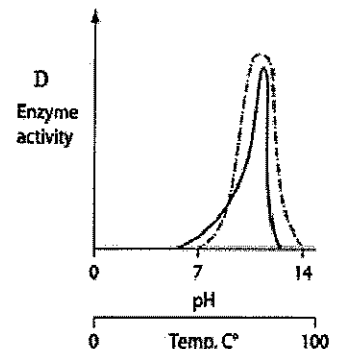
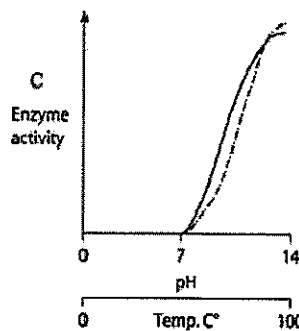
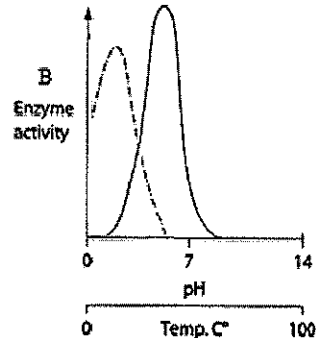
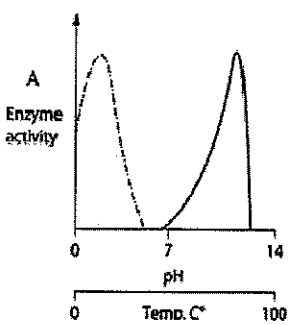


- Which chemical treatment was most effective at inhibiting the growth of *S.epidermidis*?
  - Chlorhexidine/silver sulfadiazine
  - Silver/carbon/platinum
  - Minocycline/rifampin
- Which chemical treatment would you use to inhibit the growth of *S.epidermidis* AND *C.albicans* simultaneously?
  - Chlorhexidine/silver sulfadiazine
  - Silver/carbon/platinum
  - Minocycline/rifampin

- The graphs below show the activity of four different enzymes that are critical to cell division in each of four different species of bacteria. Which species of bacteria (A, B, C, or D) would grow better than the others in the conditions of the human stomach? (Assume these conditions are acidic, 37 °C.)

KEY: ----- pH

————— Temp.



**Match the examples or descriptions in #4-19 with the correct classification of microbe (A-H).**

- |                              |                   |
|------------------------------|-------------------|
| 4. Ascariasis                | A. Algae          |
| 5. Botulism                  | B. Archaea        |
| 6. Candida                   | C. Bacteria       |
| 7. Creutzfeldt-Jakob disease | D. Fungus         |
| 8. H1N1 influenza            | E. Parasitic worm |
| 9. Hepatitis                 | F. Prion          |
| 10. Malaria                  | G. Protozoan      |
| 11. Measles                  | H. Virus          |
| 12. MRSA                     |                   |
| 13. Pertussis                |                   |
| 14. Polio                    |                   |
| 15. Tetanus                  |                   |
| 16. Volvox                   |                   |

**Assign each microbe (A-H) into one of three categories below.**

17. Prokaryotic microbes (2 answers)
18. Eukaryotic microbes (4 answers)
19. Acellular microbes (2 answers)

**20. Which of the following correctly lists three types of microbes from the smallest in size to the largest?**

- A. Virus, bacteria, protozoa
- B. Virus, protozoa, bacteria
- C. Protozoa, bacteria, virus
- D. Bacteria, virus, protozoa

**21. Which type of microbe is capable of photosynthesis?**

- A. Cyanobacteria
- B. Yeast
- C. Virus
- D. Parasitic worm

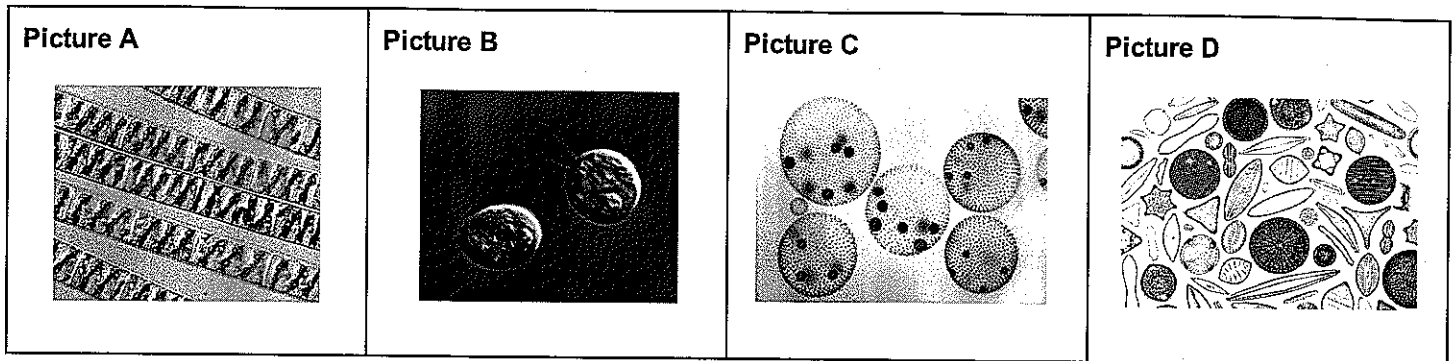
**22. Which type of microbe, living in the soil, is capable of nitrogen fixation?**

- A. Algae
- B. Bacteria
- C. Parasitic worm
- D. Fungus

**23. What is the effect of algal blooms on fish populations in a freshwater ecosystem such as a lake?**

- A. Algal blooms increase food available for fish, resulting in an increase in fish reproduction.
- B. Algal blooms decrease food available for decomposers, thereby decreasing food available for fish.
- C. Algal blooms increase the dissolved oxygen content of lakes, allowing for increased cellular respiration.
- D. Algal blooms decrease the dissolved oxygen content of lakes, causing many fish to die.

The pictures below show four different types of microbes.



24. Which picture shows *Volvox*?

25. Which picture shows *Spirogyra*?

26. Which picture shows *Chlamydomonas*?

27. Which picture shows diatoms?

28. In the pictures above, what do all four types of organisms have in common?

- A. All are photosynthetic.
- B. All are prokaryotic.
- C. All are pathogenic.
- D. All are symbiotic.

29. What effect do viruses have on your body that enables them to cause disease?

- A. Viruses produce toxins.
- B. Viruses deprive healthy cells of nutrients.
- C. Viruses cause fever.
- D. Viruses take over host cell operations.

30. Which of the following statements about the cycles of viral reproduction is NOT true?

- A. The lytic cycle creates hundreds of copies of new viruses.
- B. The lytic cycle results in host cell death.
- C. The lysogenic cycle reproduces viral DNA in a dormant state.
- D. The lysogenic cycle assembles new viruses.

31. Approximately what percentage of all microbes cause disease?

- A. Less than 1%
- B. Between 2-5%
- C. About 50%
- D. Between 80-90%

32. The antibiotics we receive passively through our food supply \_\_\_\_.

- A. help protect us from infection
- B. cause mutations in bacteria
- C. select for drug resistant bacteria
- D. are spread by viruses

Identify the most descriptive term for the bacterial shapes and arrangements using the terms A-J.

33.



A. Bacillus

34.



B. Coccobacillus

C. Coccus

D. Diplobacilli

E. Diplococci

F. Sarcina

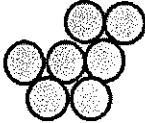
G. Staphylococci

H. Streptobacilli

I. Streptococci

J. Vibrio

35.



36.



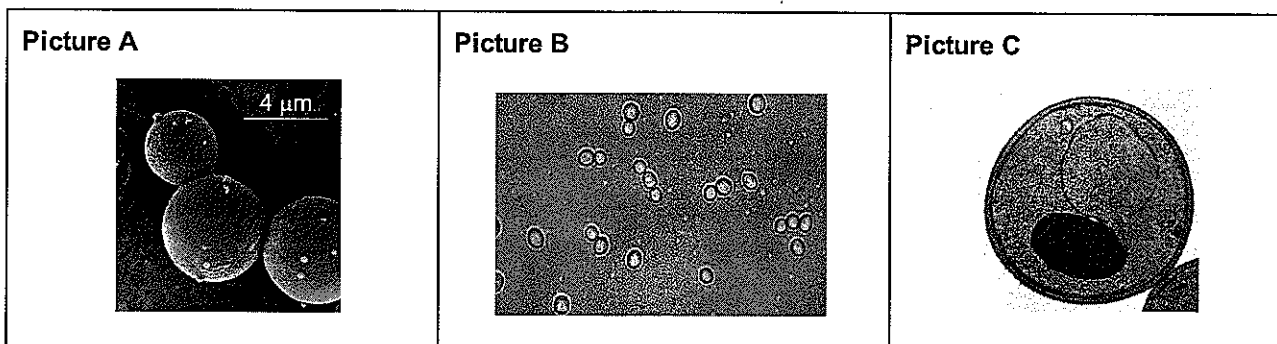
37. How do the cells of fungi differ from bacteria?

- A. Fungi have a nucleus and bacteria do not.
- B. Fungi have a cell wall and bacteria do not.
- C. Fungi have a cell membrane and bacteria do not.
- D. Fungi have ribosomes and bacteria do not.

38. How do viruses differ from prions?

- A. Viruses cause disease and prions do not.
- B. Viruses contain protein and prions do not.
- C. Viruses contain genetic material and prions do not.
- D. Viruses are made of cells and prions are not.

The pictures below feature the same organism viewed under three different types of microscopes.



39. Which picture was taken using a transmission electron microscope?

40. Which picture was taken using a scanning electron microscope?

41. Which picture was taken using a light microscope?