

COLUMBIA HIGH SCHOOL

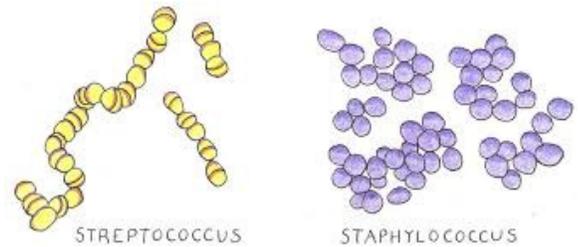
Microbe Mission Key

Division C

Captain's Tryouts 2018

1. A
2. B
3. C
4. TEM: view internal structures (1),
2D images (1)
SEM: view external structures (1),
3D images (1)
5. Parasitic worms, unicellular
eukaryotes, prokaryotes, viruses,
prions
6. B
7. F
8. B
9. A
10. **Gram positive:** contain thick
peptidoglycan layer, teichoic acids
Gram negative: thin
peptidoglycan layer, has an outer
membrane and periplasmic
space between membrane and
peptidoglycan, have a high
lipopolysaccharide content
11. A mordant in cell staining are
ions that chemically bind with
dyes to form a complex that will
precipitate so the dye will not
wash away. (1) Gram stains use
iodine as a mordant. (1)
12. P
13. PR
14. V
15. F
16. F
17. B
18. V
19. Vibrio or comma-shaped
20. Bacillus or diplobacillus

21.



22. Likely has athlete's foot (1), treat
with antifungals (1), keep feet
clean and dry (1)
23. MAX 2 POINTS: Purify water
from the wilderness (1); wash
your hands (1); drink bottled
water
24. D
25. Lactic acid bacteria
26. Anaerobes do not need oxygen
to produce energy, aerobes
require oxygen, facultative
anaerobes can do either
27. Algae
28. Ciliates
29. Baker's yeast
30. The theory of endosymbiosis
states that mitochondria and
chloroplasts were likely
prokaryotes that were engulfed,
subsequently forming eukaryotes.
(1) Evidence can include: Double
membrane suggests that
chloroplasts and mitochondria
were once separate entities (1);
they have their own ribosomes
and DNA (1); ribosomes found in
mitochondria and chloroplasts
are the same type as found
exclusively in prokaryotic cells(1);
DNA is circular like in
prokaryotes(1); DNA is packaged
without histones which are

- exclusively found in eukaryotes(1); Protein synthesis begins with same protein as in prokaryotes(1). Max of three evidence points.
31. Jam has so much sugar that it lowers the water activity below viable levels for food spoilage organisms. (1). Sugar also aids the growth of beneficial bacteria (1)
 32. FALSE; Viruses are not living organisms.
 33. FALSE; Oil immersion increases resolution.
 34. TRUE
 35. TRUE
 36. FALSE; Yeasts are facultative anaerobes.
 37. TB One method is the boiling water bath. Jars are heated while submerged in boiling water and cooked for a specific amount of time. (1) The other method is pressure canning. Jars are put in a few inches of water in a special pressure cooker with a temperature of at least 240°F. (1) Pressure canning is safer. (1) Pressure canning is the only one able to destroy *Clostridium botulinum* (botulism) spores. (1)
 38. Halophile(s)
 39. Psychrophile(s)
 40. Thermophile(s)
 41. Oligotroph(s)
 42. TB Differential interference contrast
 43. TB Darkfield
 44. Phase contrast
 45. Transmission electron (TEM)
 46. *Treponema pallidum*
 47. *Clostridium botulinum*
 48. *Staphylococcus aureus*
 49. *Vibrio cholera*
 50. *Bordetella pertussis*
 51. *Streptococcus mutans*
 52. ***Treponema pallidum***: syphilis
Clostridium botulinum: botulism
Staphylococcus aureus: MRSA
Vibrio cholera: cholera
Bordetella pertussis: whooping cough
Streptococcus mutans: strep throat