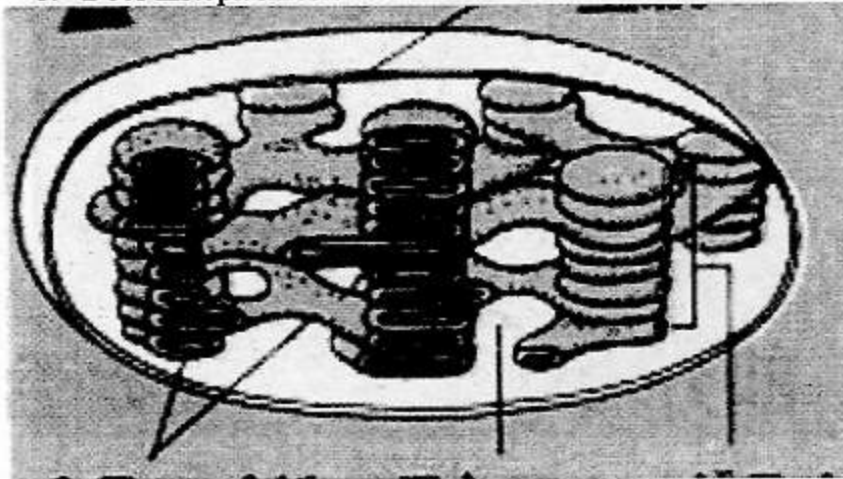


STATION 1

1. What is the typical microscope used to reveal the inside of a cell? TEM
2. How does one determine the magnification power of a light microscope?
MULTIPLY OBJECTIVE POWER BY LENS POWER
3. How do the lenses differ between light microscopes and electron microscopes?
LIGHT MICROSCOPES USE OPTICS WHILE ELECTRON MICROSCOPES USE ELECTROMAGNETIC LENSES
4. What scanning probe microscope relies on the technique of measuring the interaction force between the cantilever tip and the surface of the sample? AFM
5. Which part of a light microscope controls the amount of light shining on a specimen? DIAPHRAGM

STATION 2

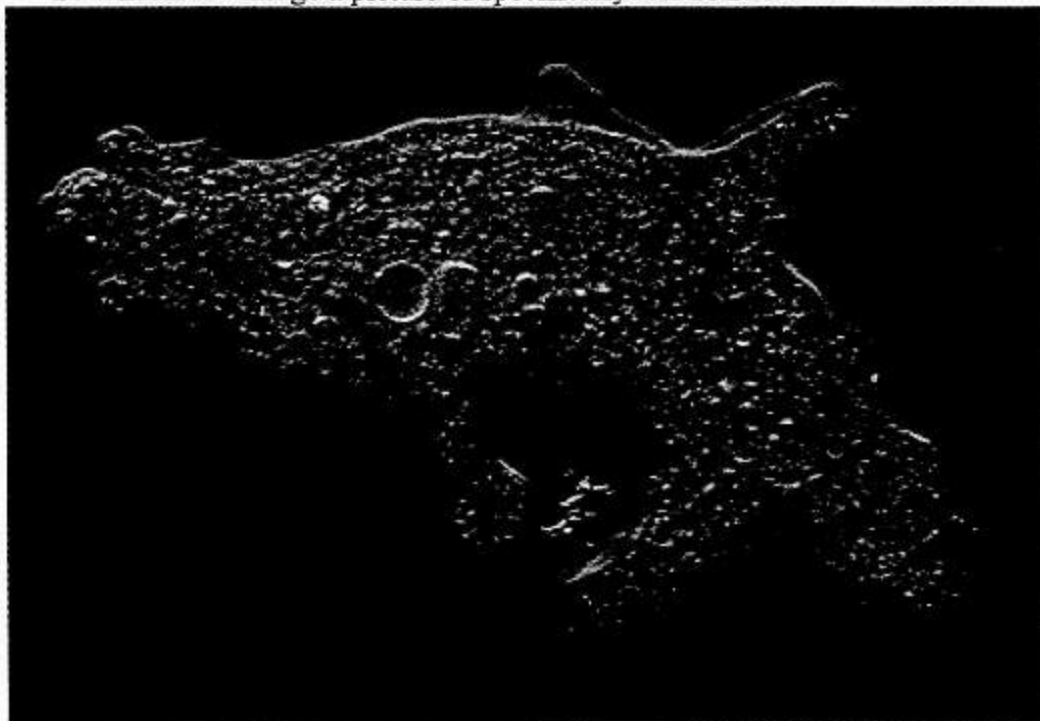
1. Does histoplasmosis contain nuclei in its cells? YES



2. A. What are the stacks in the figure above called? GRANUM
B. What process takes place in the area outside these stacks? CALVIN CYCLE
C. Name microbe type(s) that have the above organelle. PLANTLIKE
PROTISTS, PHOTOSYNTHETIC BACTERIA
3. What does the endosymbiotic theory say about mitochondria? IT AROSE FROM A BACTERIUM MAKING A LIVING COMMUNITY INSIDE ANOTHER BACTERIUM
4. What can be said about polio, tetanus, and malaria regarding mitochondria?
MALARIA HAS MITOCHONDRIA WHILE THE OTHERS DO NOT

STATION 3

1. What microbe type can be methanogens? ARCHAEABACTERIA
2. What microbe type can cause disease by forming protein clumps? PRIONS
3. What microbe type is fought off by vaccines? VIRUS
4. A. Does the following image depict a eukaryote, prokaryote, or neither?
EUKARYOTE
B. What is the image a picture of specifically? AMOEBA

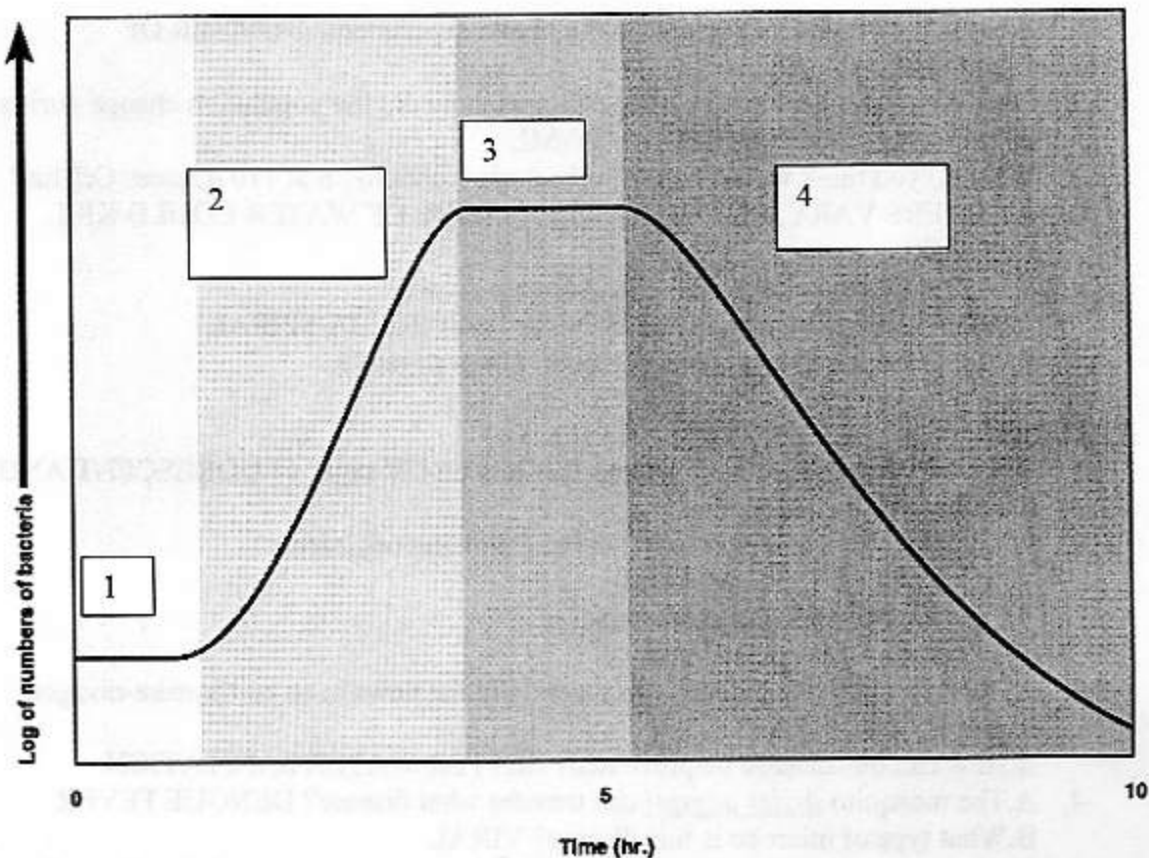


5. What metric measurement would be used to describe the size of a typical prokaryote? MICROMETER

STATION 4

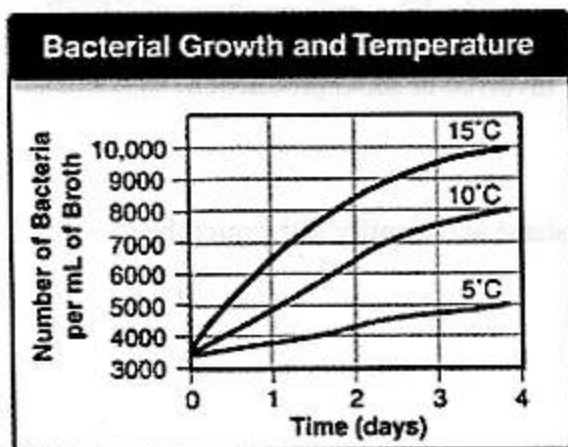
1. What type of microbe can be used in the production of ethanol? BACTERIA
2. What do the microbes *Gonyaulax* and *Karenia* cause? Is this harmful or beneficial? WHY? RED TIDE; HARMFUL; MAKE SHELLFISH TOXIC
3. How can neither prokaryotes nor eukaryotes affect prokaryotic food fermentation? BACTERIOPHAGES (VIRUSES) AFFECTING BACTERIA
4. Describe how a common human fungal disease could be directly linked with the production of a libation using another organism from the fungus kingdom. ATHLETE'S FOOT—GRAPE SMASHING – WINE
5. What is the difference between prebiotics and probiotics? PRE—NONDIGESTIBLE FOOD INGREDIENTS THAT STIMULATE THE ACTIVITY OF BACTERIA; PRO—LIVE MICROORGANISMS THAT GIVE A HEALTH BENEFIT TO HOST

STATION 5



1. What type of microbe growth is shown above? BACTERIAL
2. What is #1 called? LAG PHASE
3. What is #2 called? LOG/EXPONENTIAL GROWTH
4. What is #3 called? STATIONARY PHASE
5. What is #4 called? DEATH/LOG DECLINE

STATION 6



MICROBE MISSION ANSWER KEY 2011 VALLEY FORGE DIVISION C

1. What is the dependent variable in the above experiment? NUMBER OF BACTERIA
2. For the bacteria kept at 15 degrees Celsius, how did the population change during the experiment? 3000/ML TO 10,000/ML
3. What do you think would happen if bacteria were grown at 110 degrees Celsius? ANSWERS VARY, BUT BOILING +NATURE OF WATER COULD KILL BACTERIA
4. If the graph above related to Lyme disease growth:
 - A. What shape does it have? SPIROCHETE/SPIRILLIA/SPIRAL
 - B. Is it gram positive or gram negative? Gram negative

STATION 7

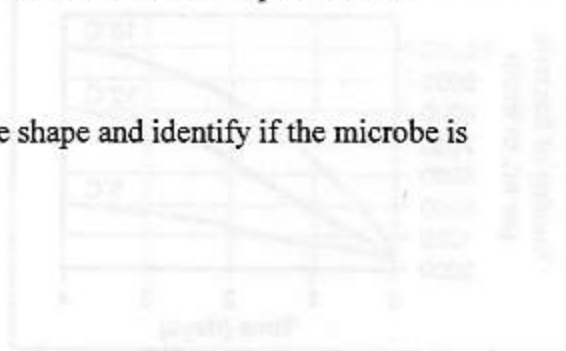
1. What are two types of microscopes that rely on UV rays? FLUORESCENT AND CONFOCAL
2. What is the size (in metric units) of the following organisms:
 - a. Rabies 0.15 micrometers
 - b. Small Pox 0.3 micrometers
 - c. Polio 0.03 micrometers
3. A. What prokaryotic disease was recently in the news in an earthquake-ravaged country? CHOLERA
B. How can this disease be prevented? BETTER WATER SANITATION
4. A. The mosquito *Aedes aegypti* can transfer what disease? DENGUE FEVER
B. What type of microbe is this disease? VIRAL
C. Where should one not travel if he or she does not want to catch the disease? 35N-35S, SINGAPORE

STATION 8

1. What two general types of microbes play a key role in food spoilage? BACTERIA AND FUNGUS
2. What two food preservation techniques can affect microbe growth? SALT, HIGH ACID
3. What is one bacterium that is often used to produce cheese? *Streptococcus* OR *Lactobacillus*
4. How is Kefir production different from Acidophilus milk production? KEFIR – BACTERIA AND FUNGUS; ACID – ACIDOPHILUS MILK
5. What general type of microbe can be involved in MSG production? BACTERIUM

STATION 9

For each of the following images, name the shape and identify if the microbe is prokaryotic or eukaryotic.

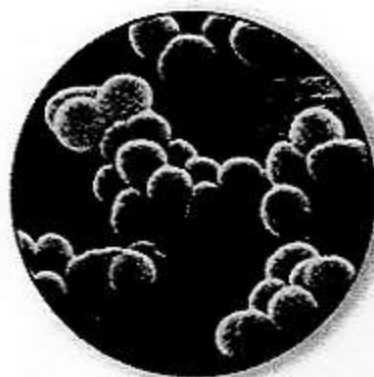


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1.

BACCILA; PROK



2.

COCCUS; PROK



3.

SPIRILLA; PROK

4. Gram-staining is done to what type of prokaryote? EUBACTERIA
5. A. Visually, how is a Gram-positive result different from a Gram-negative result?
POSITIVE – VIOLET; NEGATIVE – PINK, LIGHT RED

MICROBE MISSION ANSWER KEY 2011 VALLEY FORGE DIVISION C

B. Structurally, how is a Gram-positive bacterium different from a Gram-negative result? POSITIVE – THICK PEPTOGLYCAN; NEGATIVE – THIN PEPTOGLYCAN

STATION 10

Match the disease with the type of organism that produces it.

- A. VIRAL B. BACTERIAL C. FUNGAL
D. PROTOZOAN/ALGAL E. PRION

1. Mumps A
2. Botulism B
3. Tetanus B
4. Thrush C
5. Yellow fever A
6. Malaria D
7. Dental carries B
8. Strep throat B
9. Ebola A
10. Peptic Ulcer B
11. Mad cow disease E
12. Ringworm C