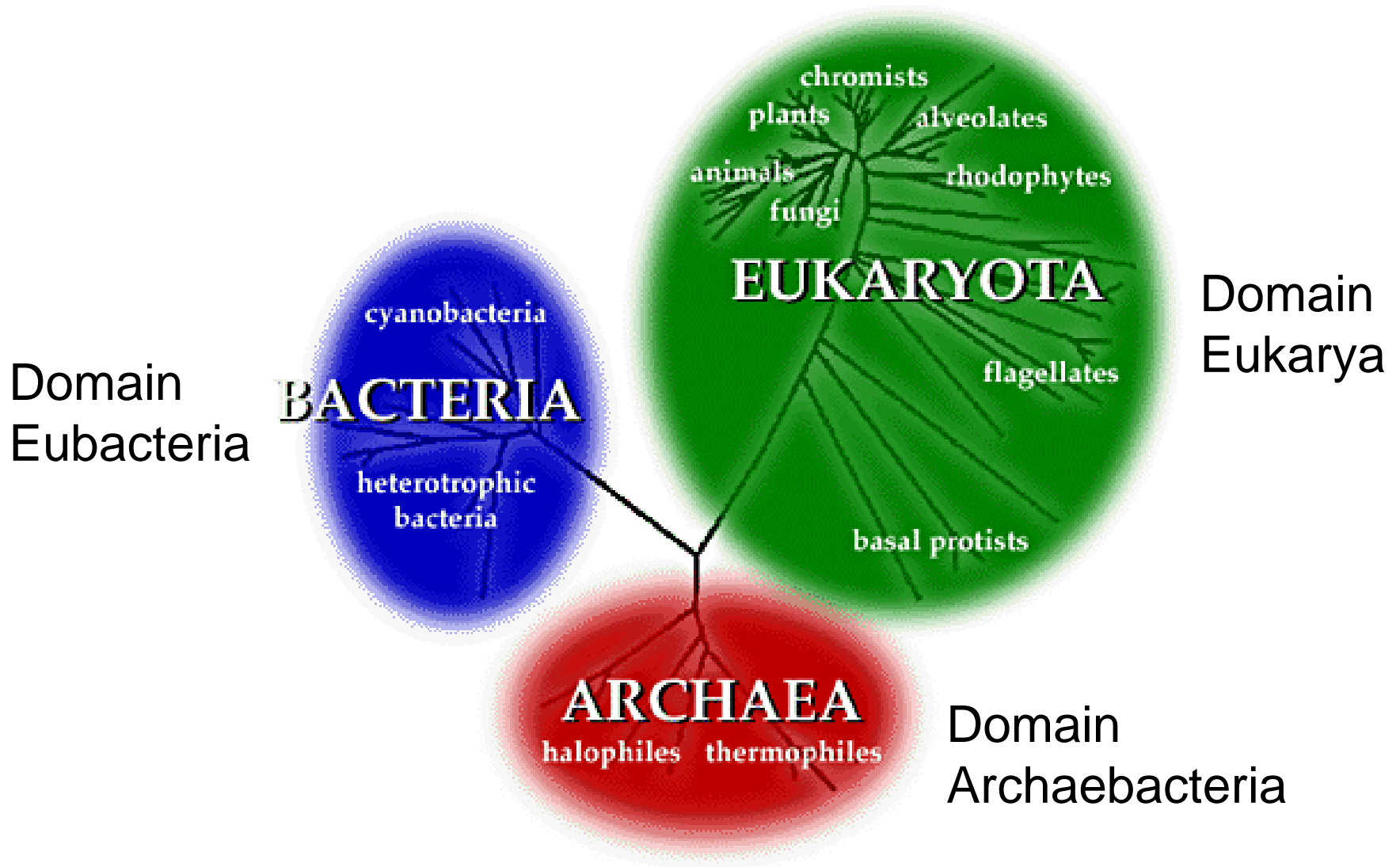


# Surrounded By Microbes

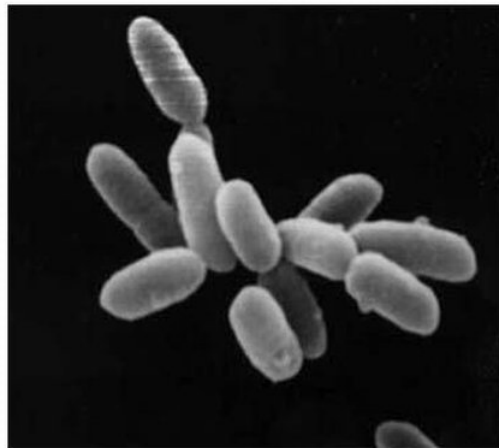
The Small Organisms of Earth

# The Three Domains



# Domain Archaea

Archaeobacteria can be found everywhere even in extreme environments such as hot springs or waters with sulfur or high salinity.

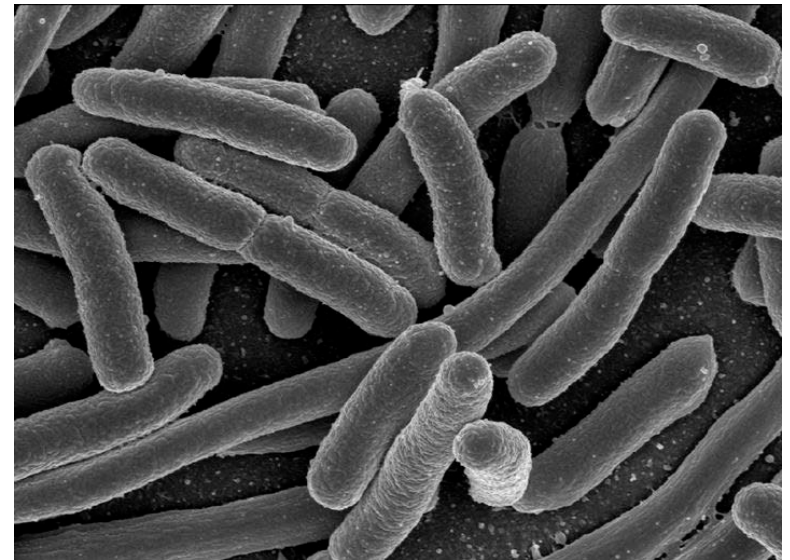
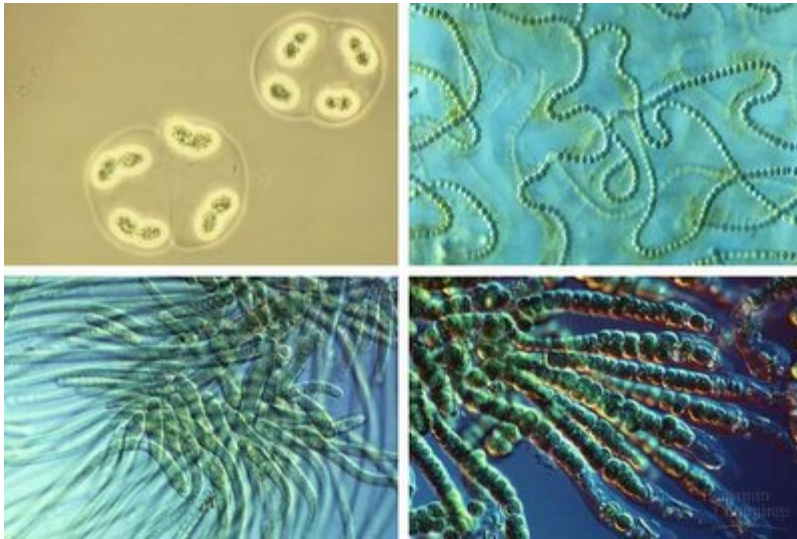


Archaeobacteria are small like all bacteria - this is a scanning electron micrograph.

# Domain Eubacteria

These are the bacteria you are most familiar with since they cause disease and are in your everyday environment.

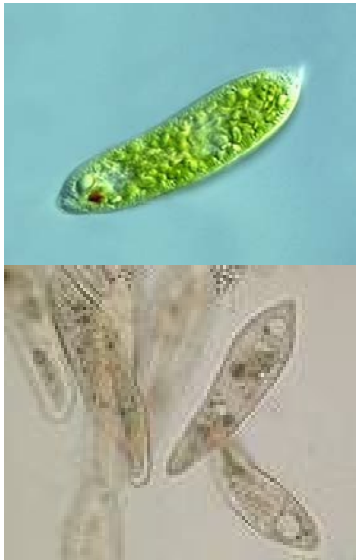
Did you know that you have 10X more bacteria on and within your body than your own body cells?



Bacteria can be photosynthetic or not.

# Domain Eukarya

All other organisms on earth are in this domain.



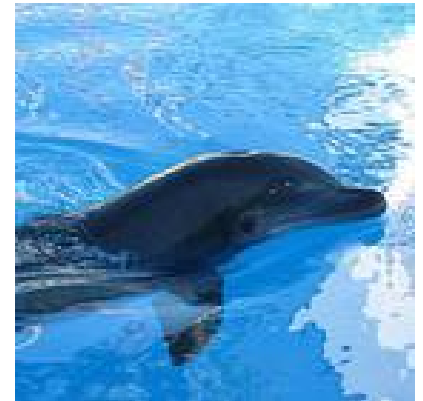
Protists



Fungi



Plants



Animals

Of all these organisms, in this lab we will examine:

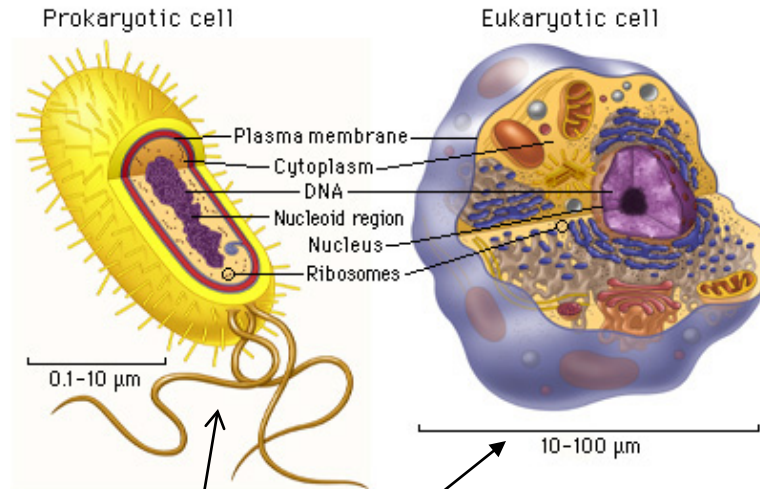
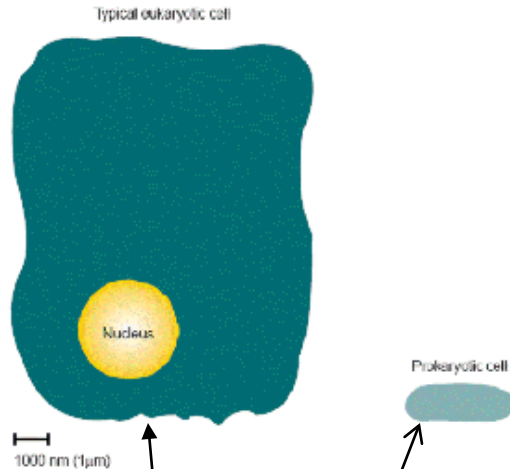
- **True bacteria** of the Domain Eubacteria, both **photosynthetic** and **non photosynthetic**.
- **Protists** of the Domain Eukarya, both **photosynthetic** and **non photosynthetic**.
- **Fungi** of the Domain Eukarya, all are **non photosynthetic**.

For today's lab, you will answer these questions -

- Is the organism you are looking at **prokaryotic or eukaryotic**?
- Is the organism you are looking at **heterotrophic or phototrophic**?
- Is the organism you are looking at **unicellular or multicellular**?



# Prokaryotic Vs. Eukaryotic Cells



Eukaryotic cells are much larger and have a true nucleus!

Prokaryotic cells have no nuclei and are smaller.

Eukaryotic cells have many membrane organelles such as chloroplasts so are much more complex than prokaryotic cells. Prokaryotic cells lack chloroplasts and mitochondria and other membranous organelles,.

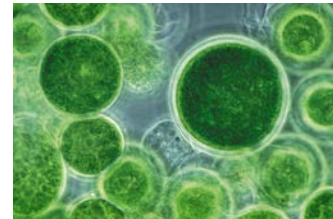


# Heterotrophic vs. Phototrophic

- Heterotrophic - relies on other organisms to obtain food energy.



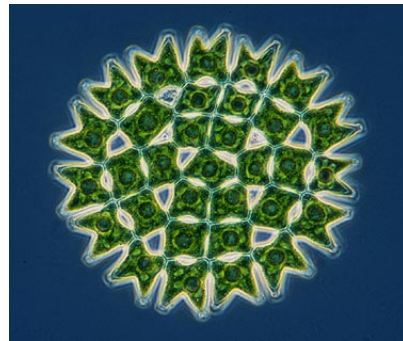
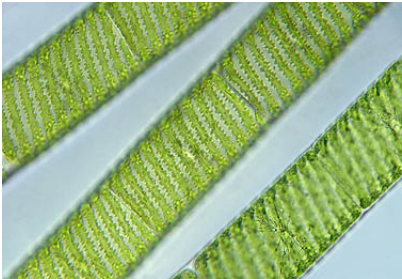
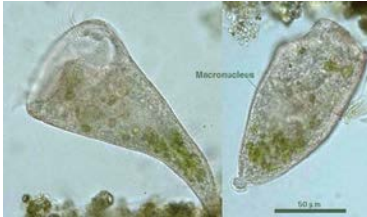
- Phototrophic - uses sunlight to generate own food energy.



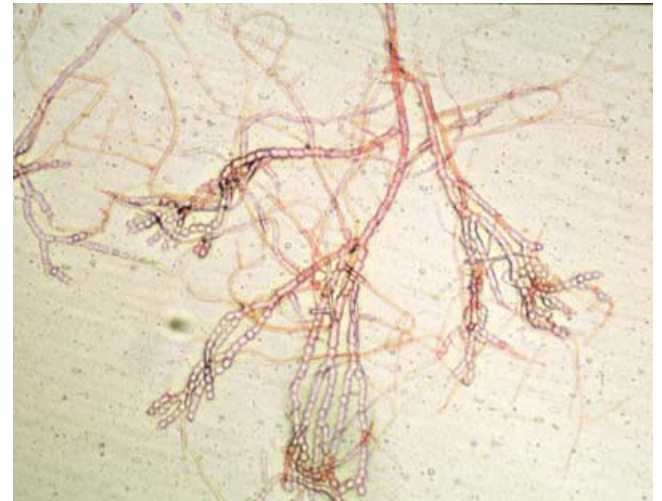
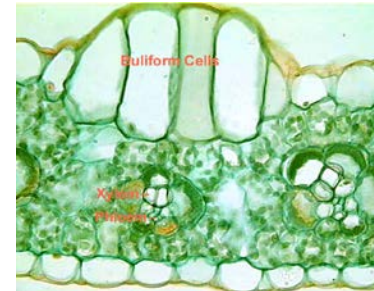
Which one is colorless? heterotrophic

# Unicellular Vs. Multicellular

- Unicellular - single celled or colonies or filaments of all the same cell types.



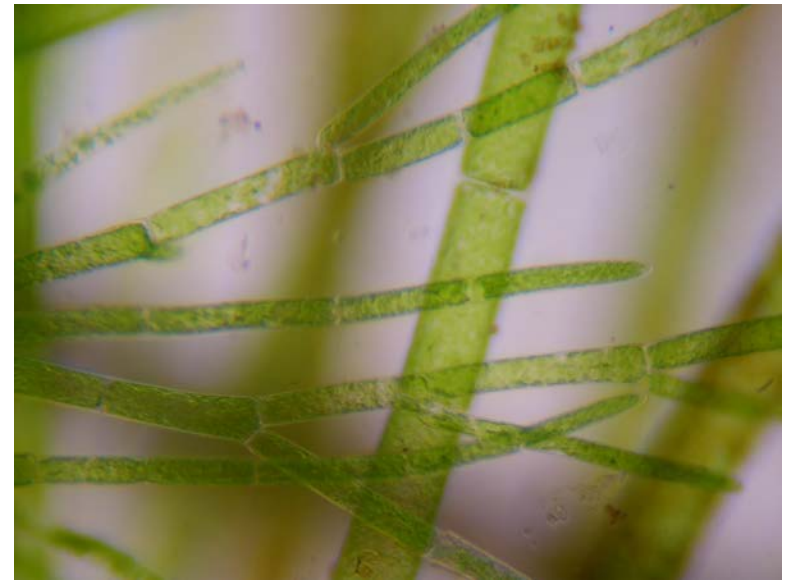
- Multicellular - more than one cell type.



For each of these, answer the three questions:  
Prokaryotic or Eukaryotic?  
Heterotrophic or Phototrophic?  
Unicellular or Multicellular?



#1

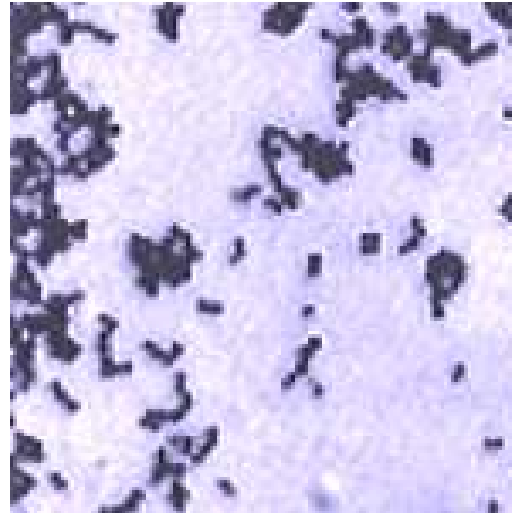


#2

For each of these, answer the three questions:  
Prokaryotic or Eukaryotic?  
Heterotrophic or Phototrophic?  
Unicellular or Multicellular?



#3



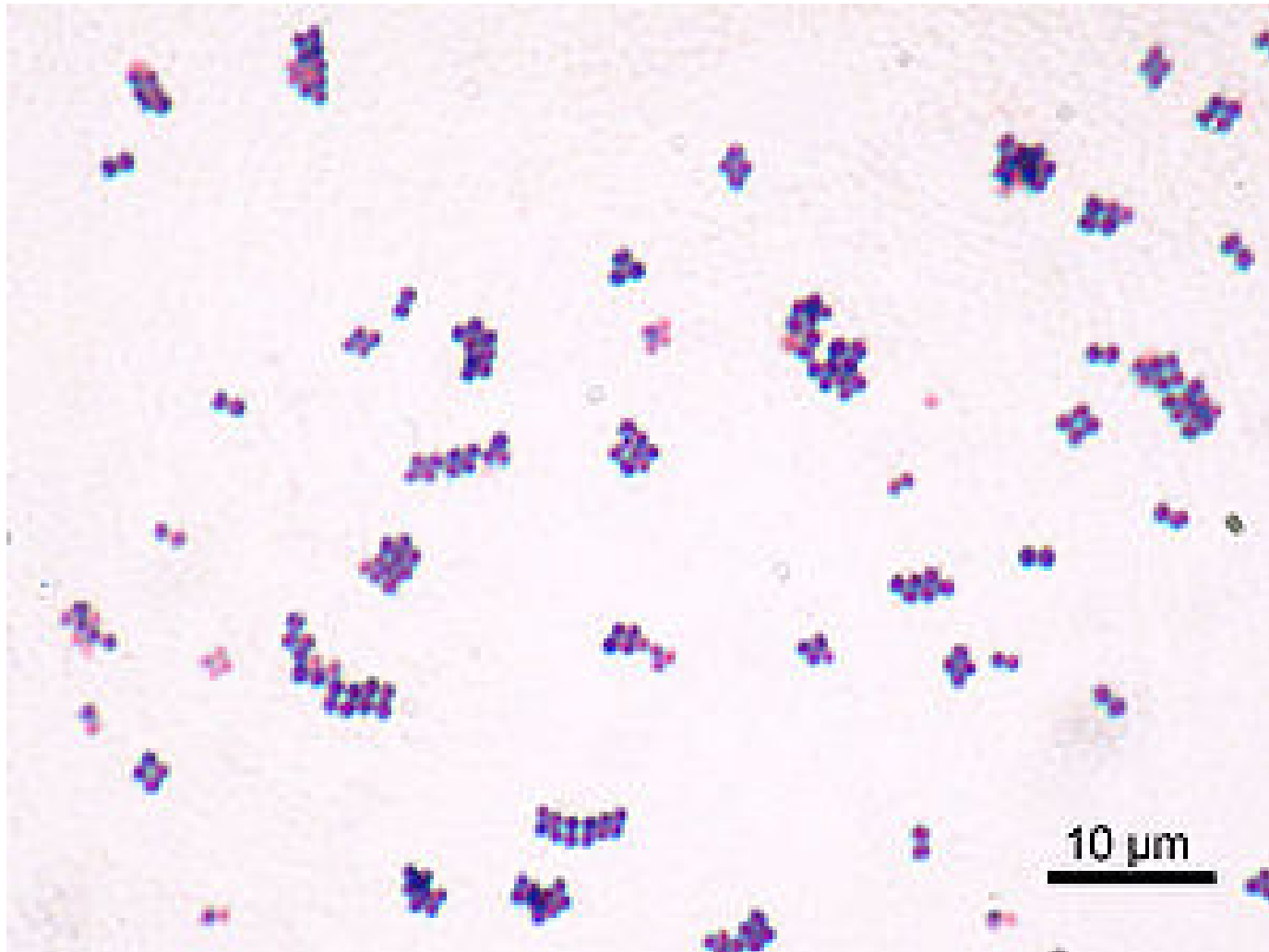
#4 If these cells were not stained, they would be colorless



#5

# Shapes of Bacteria - spherical

(coccus)



# Shapes of Bacteria - rod

(bacillus)



# Shapes of Bacteria - spiral

(spirillum)





# Today:

- Under 40X, you will look at and draw:
- *Nostoc* (an example of a cyanobacterium)
- *Spirogyra* (an example of a true alga)
- These are BOTH phototrophic (no matter what stain is used!) Show relative size difference in your drawings.
- Then take a drop of mixed algae and look for an example of a cyanobacterium and a true alga. Show your instructor.
- Draw and make a list of characteristics of each next to your drawings.
- Stamping place.

# For clean up, please

- Put all prepared slides back where they belong.
- Remember to reuse slide and cover slip throughout lab.
- Wash, dry, and return slide and throw away cover slip at end of lab.
- Put away microscopes correctly.
- Wipe down tables and push in chairs.
- Thank you!