

# Classification Week 1

SB4a

# Classification/ Taxonomy

- Our last unit in Biology!



# Standards we will cover:

- SB4. Obtain, evaluate, and communicate information to illustrate the organization of interacting systems within single-celled and multi-celled organisms.
  - a. Construct an argument supported by scientific information to explain patterns in structures and function among clades of organisms, including the origin of eukaryotes by endosymbiosis. Clades should include:  archaea  bacteria  eukaryotes  fungi  plants  animals
  - b. Analyze and interpret data to develop models (i.e., cladograms and phylogenetic trees) based on patterns of common ancestry and the theory of evolution to determine relationships among major groups of organisms.
  - c. Construct an argument supported by empirical evidence to compare and contrast the characteristics of viruses and organisms.

TAXONOMY

Taxonomy- science of classifying & naming organisms based on similarities.

1. Aristotle-

- developed first system of classification.
- Very vague; NO LONGER USED
- Divided & classified organisms as:

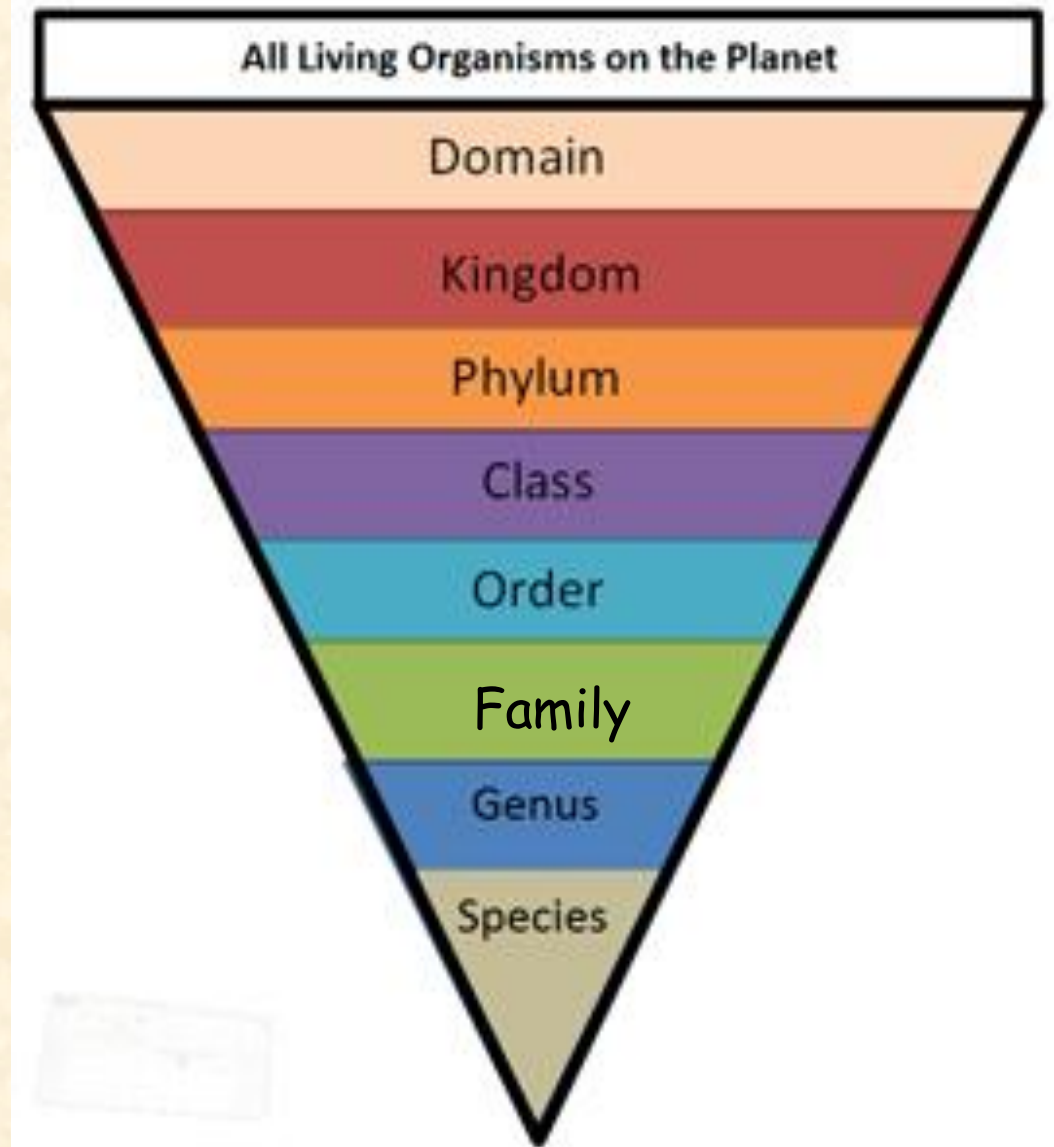
1. PLANTS

- a. Trees (large)
- b. Shrubs (medium)
- c. Grasses (small)

2. ANIMALS

- a. Land
- b. Air
- c. water

Broadest



Most specific

## 2. Carolus Linneaus-

- developed system we use today.
- developed 8 levels of classification (figure to the right)
- developed binomial nomenclature (next slide)

# Binomial Nomenclature

- binomial nomenclature-  
two word system for  
naming organisms (AKA-  
scientific names)
  - Scientific names reduce  
confusion of regional names
  - EX: *Felis concolor* is  
scientific name for puma,  
mtn. lion, cougar



# *Felis catus*

- A. Dog
- B. Cat
- C. Bird
- D. Fish





# *Dionaea muscipula*

- A. Bigleaf maple
- B. Dandelion
- C. Venus Flytrap
- D. Buttercup



# *Panthera pardus*

- A. Leopard
- B. Jaguar
- C. Cheetah
- D. Cougar



# *Equus caballus*

- A. Sheep
- B. Goat
- C. Horse
- D. Mule



# *Agkistrodon contortrix*

- A. Copperhead snake
- B. Short-horned Lizard
- C. Boreal Toad
- D. Garter Snake





# *Toxicodendron radicans*

- A. Oleander
- B. Poison Ivy
- C. Milkweed
- D. Yellow Sage



# Scientific Naming Rules

1. Written in Latin- old language/never changes
  2. Italicized when typed; underlined when written
  3. First word is genus name- capitalized
  4. Second word is species name- lowercase
- Species name can represent:
    - Color- ex: *Acer rubrum* is a red maple
    - Who discovered it- ex: *Friula wallacii* is a spider discovered by Wallace
    - Place where discovered- ex: *Aplysia californica* is a California Sea Hare



# STOP & REVIEW

- Quick throwback to cells unit
- Let's see how much you remember (you need to know this information for this unit too!)
- 3 questions. Pause and answer each one at your own pack.



What is a major difference between prokaryotes and eukaryotes?

- A) Prokaryotes have no nucleus.
- B) All prokaryotes cause disease.
- C) Eukaryotes contain more mitochondria.
- D) Nucleic acids are found only in eukaryotes.



Which two structures are found ONLY in plant cells?

- A) vacuoles and ribosomes
- B) chloroplasts and ribosomes
- C) cell walls and chloroplasts
- D) endoplasmic reticulum and cell walls

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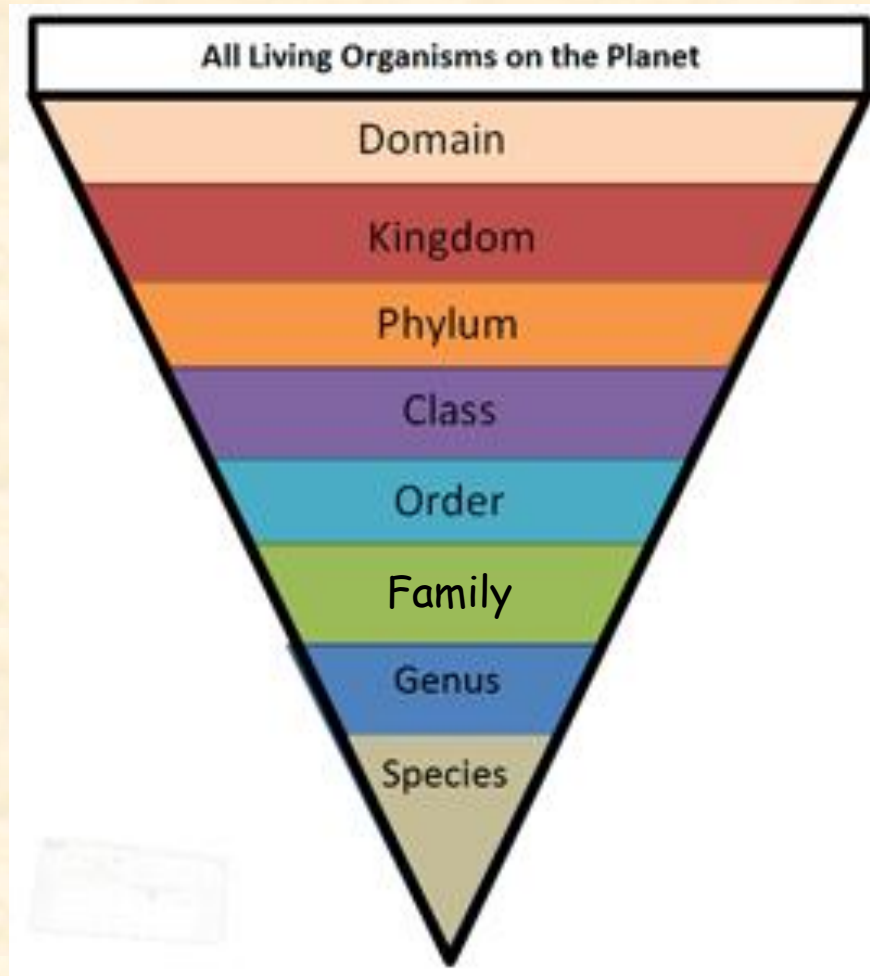


Membrane-bound organelles are not found in the cells of

- A) bacteria.
- B) fungi.
- C) plants.
- D) protists.



# Levels of Classification



Domain Eukarya

Kingdom Animalia

Phylum Chordata

Class Mammalia

Order Primates

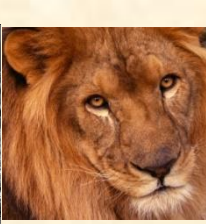
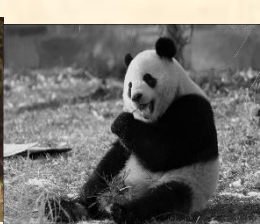
Family Hominidae

Genus *Homo*

Species  
*sapien*

Our scientific  
name is *Homo  
sapien*

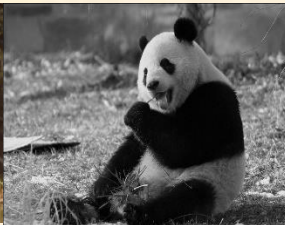
This is the  
classification  
for a human



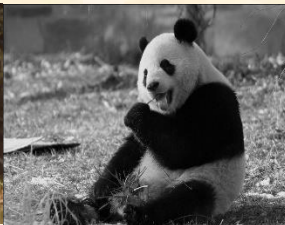
**Kingdom  
Animalia**



**Phylum  
Chordata**



**Class  
Mammalia**



**Order  
Carnivora**



**Family  
Ursidae**



**Genus  
*Ursus***



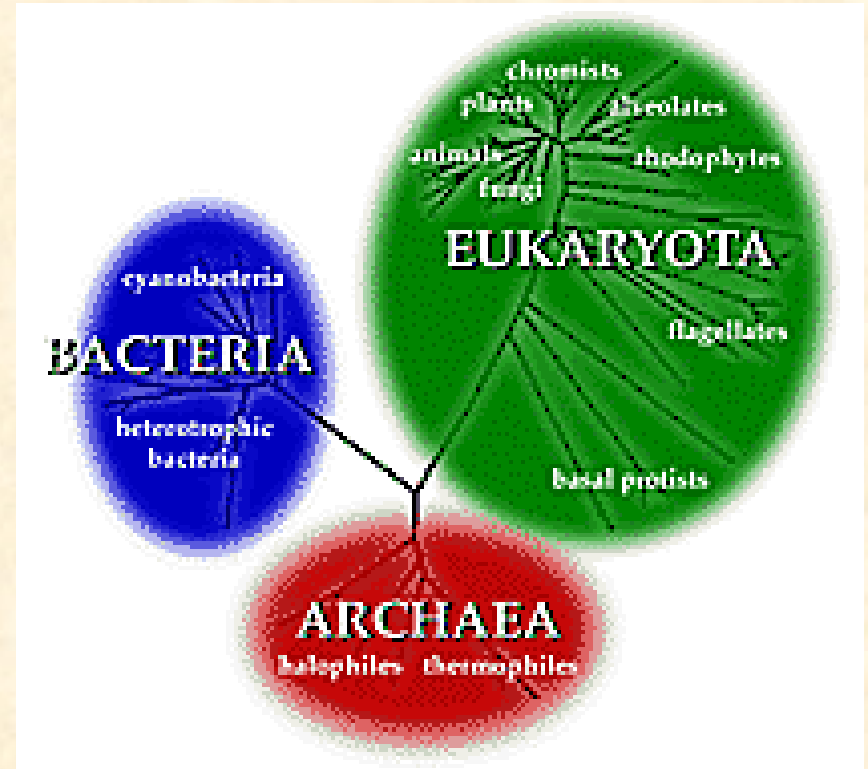
**Species  
*arctos***

# Mnemonic Device

- Domain                      Dear
- Kingdom                     King
- Phylum                     Philip
- Class                         Came
- Order                         Over
- Family                        For
- Genus                         Great
- Species                       Spaghetti

# DOMAINS

- Scientists have recently added a new category- Domains which are larger than kingdoms.
- Three domains
  - Domain Bacteria
    - Includes common bacteria
  - Domain Archaea
    - Includes extreme bacteria
  - Domain Eukarya
    - Includes protists, fungi, plants, animals



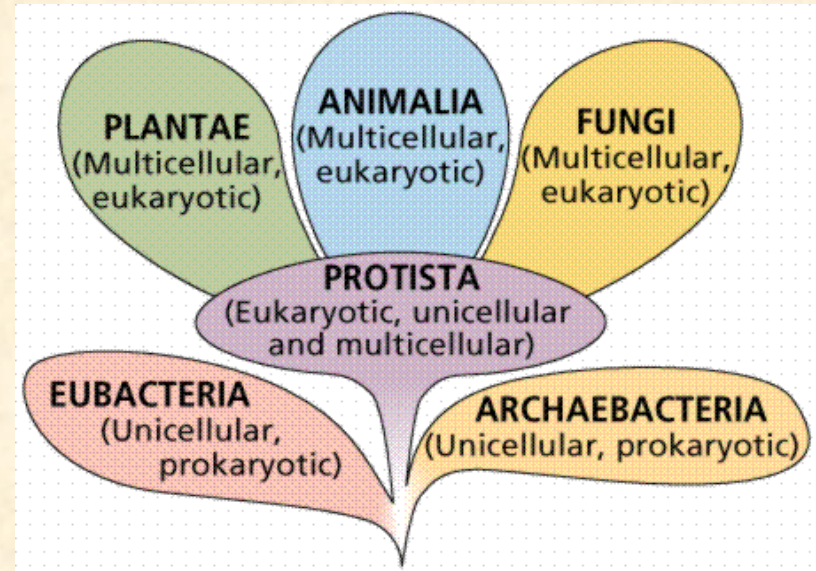
# KINGDOMS

- Organisms are classified into their different kingdoms based on
  - Cell type
  - Cell structure
  - Number of cells
  - Mode of nutrition

# THE 6 KINGDOMS

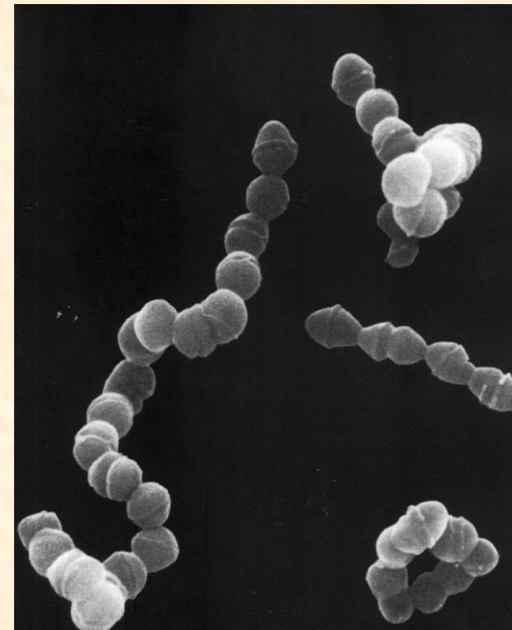
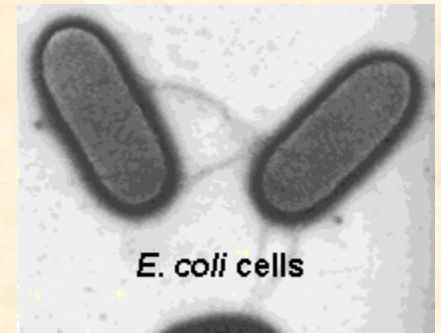
## Monera

1. Eubacteria
2. Archebacteria
3. Protista
4. Fungi
5. Plantae
6. Animalia



# KINGDOM EUBACTERIA

- EX: *E.coli* or *Streptococcus*
- Prokaryote
- Cell walls with peptidoglycan
- Unicellular
- Autotroph or heterotroph

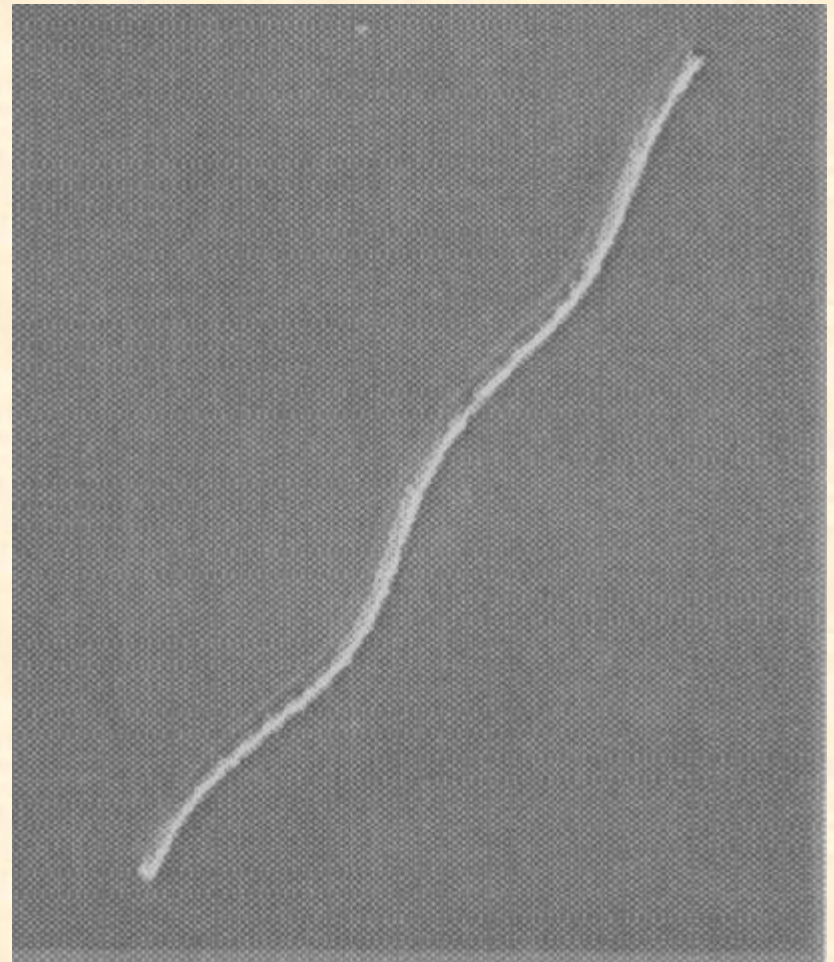




# KINGDOM

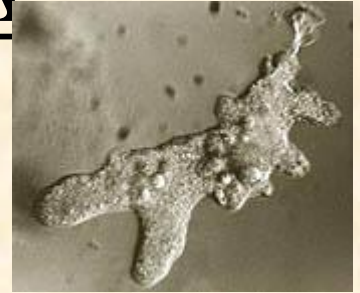
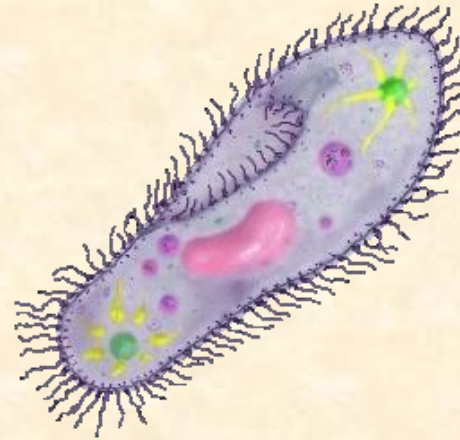
# ARCHAEBACTERIA

- EX: methanogens, halophiles- Live in extreme places
- Prokaryote
- Cell walls without peptidoglycan
- Unicellular
- Autotroph or heterotroph



# KINGDOM PROTISTA

- EX: *amoeba*, *paramecium*, slime molds, giant kelp
- Eukaryote
- Cell walls of cellulose in some, Some have chloroplasts
- Most unicellular; some colonial; some multicellular
- Autotroph or heterotroph



# KINGDOM PLANTAE

- EX: mosses, ferns, flowering plants
- Eukaryote
- Cell walls of cellulose; chloroplasts
- Multicellular
- Autotroph



# KINGDOM FUNGI

- EX: mushrooms, yeast
- Eukaryote
- Cell walls of chitin
- Most multicellular;  
some unicellular
- Heterotroph



# KINGDOM ANIMALIA

- EX: sponges, worms, insects, fish, mammals, etc.
- Eukaryote
- No cell walls or chloroplasts
- Multicellular
- Heterotroph




# STOP & CHECK

- Check for understanding
- 3 questions
- Pause and answer each one at your own pace



cell wall  
chloroplasts  
mitochondria  
small vacuoles  
eukaryote cells



 How would you change the characteristics in this list, to describe the cells of organisms in the PLANT kingdom?

- A) remove *mitochondria*
- B) change *eukaryote* to *prokaryote*
- C) change *cell wall* to *cell membrane*
- D) change *small vacuole* to *large central vacuole*

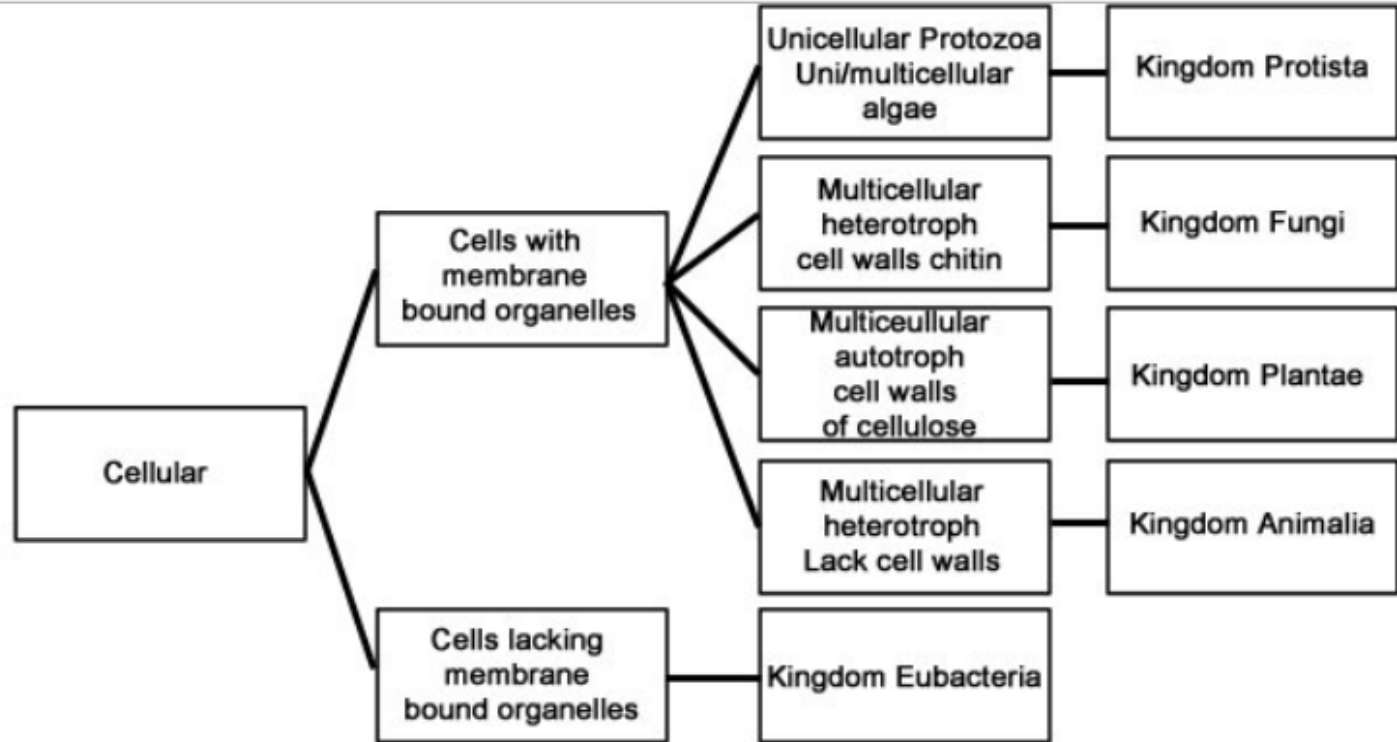
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Which kingdom contains only producers?

- A) Animalia
- B) Fungi
- C) Insecta
- D) Plantae





es

While studying the classification of living things you are given a specimen that has cell walls. The ONLY kingdom you can rule out immediately is

- A) fungi.
- B) plant.
- C) animal.
- D) bacteria.