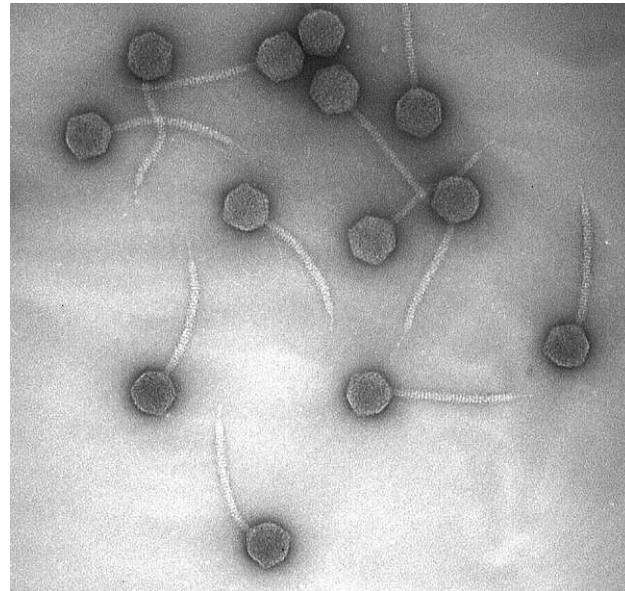


6 Kingdoms and Viruses

Viruses = Small, nonliving microbes
that can cause diseases in living
things



Characteristics

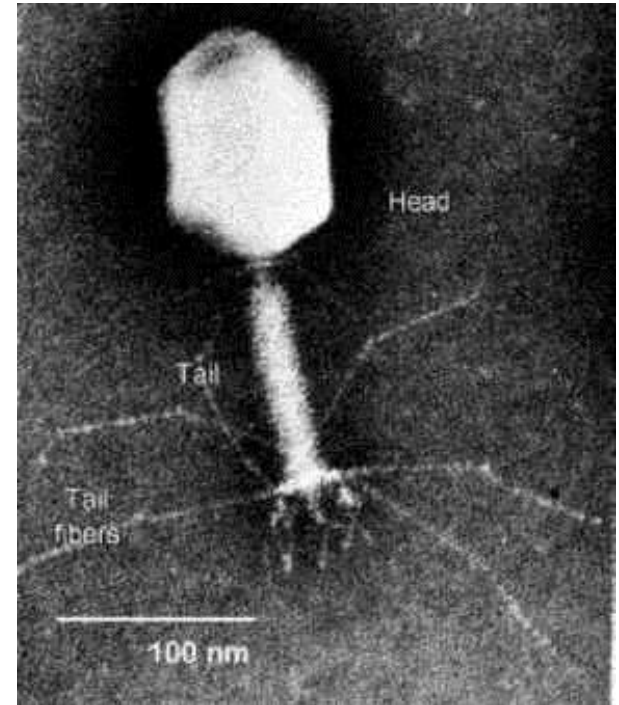
- Nonliving - need host cell to reproduce, not a cell, doesn't do metabolism
- Small
- Cause diseases in living organisms

Structure

- Protein coat
 - DNA or RNA
 - Glycoproteins – help attach to host
-
- Arrangement of proteins give different shapes and binds to different host cells

Types

- Bacteriophage
 - attaches to bacteria cells
 - studied because it has similar replication cycles as viruses that cause colds, measles, and AIDS



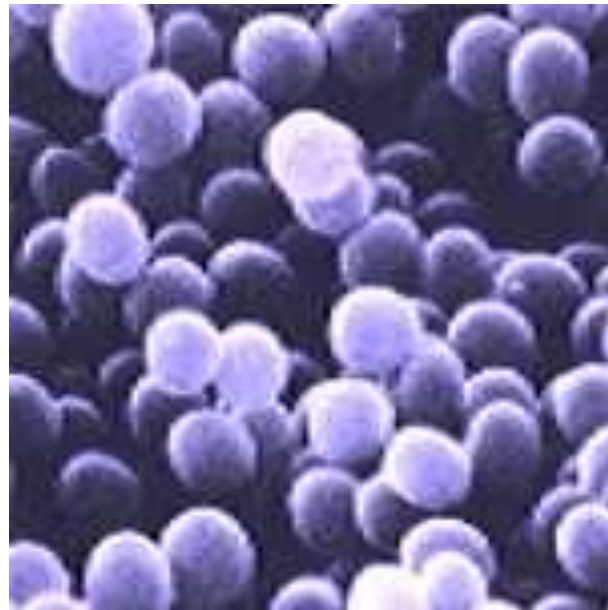
Reproduction - Lytic Cycle

- Attachment
- Entry
- Replication
- Assembly
- Release

Reproduction - Lysogenic Cycle

- Attachment
- Entry
- Integration
- Cell Multiplication
- Enters lytic cycle

Bacteria = Single-celled organisms that do not have a nucleus and are examples of prokaryotic cells



Characteristics of Eubacteria and Archaeobacteria

- Prokaryotic
- Unicellular
- Both autotroph and heterotroph
- Contains a cell wall
 - Eubacteria – has peptidoglycan
 - Archaeobacteria – does not have peptidoglycan

What are the two groups of bacteria?

- Archaeobacteria
 - “Old” bacteria
 - Live in harsh environments (hot springs, high salt concentrations, acidic, etc)
 - anaerobic environments (no oxygen)
- Eubacteria
 - “True” bacteria
 - Live Everywhere – air, rock, on surfaces
 - aerobic environments (need oxygen)
 - Contains DNA, ribosomes, cytoplasm, cell membrane, and cell wall

How do bacteria reproduce?

- Asexual
 - Binary Fission = creates two identical copies of the cell
- Sexual (pseudo)
 - Conjugation – transfers DNA from one bacterium to another through a bridge that joins the two cells
 - New genetically different cells

Characteristics of Protists

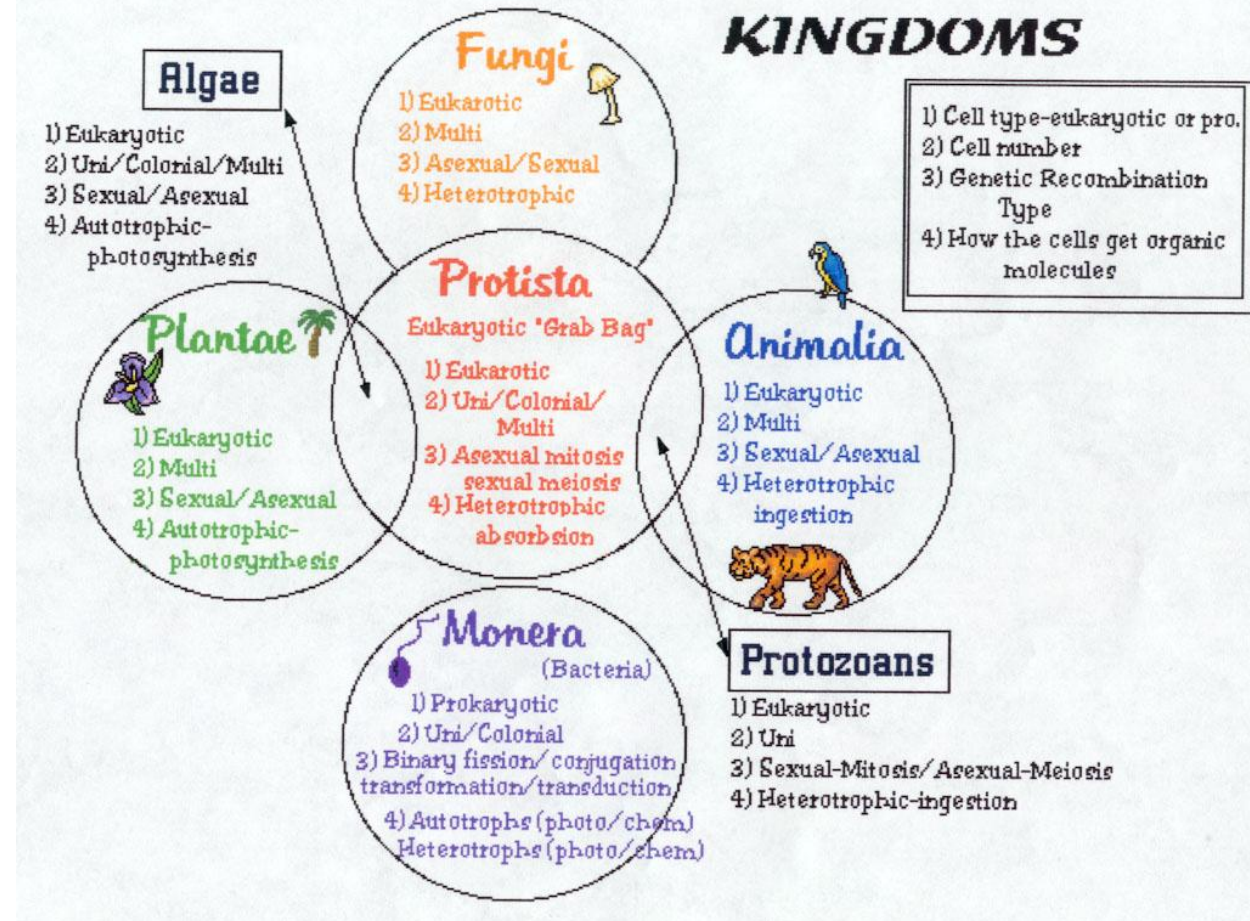
- Eukaryotic
- Multicellular and unicellular
- Autotroph and Heterotroph
- Some have a Cell wall and some don't

Why are there so many different characteristics?

- Because there are so many different types of Protists.
- And they are divided into three categories.
 - they range in size can be from microscopic to a 35 meter (about 105 feet) tall kelp.

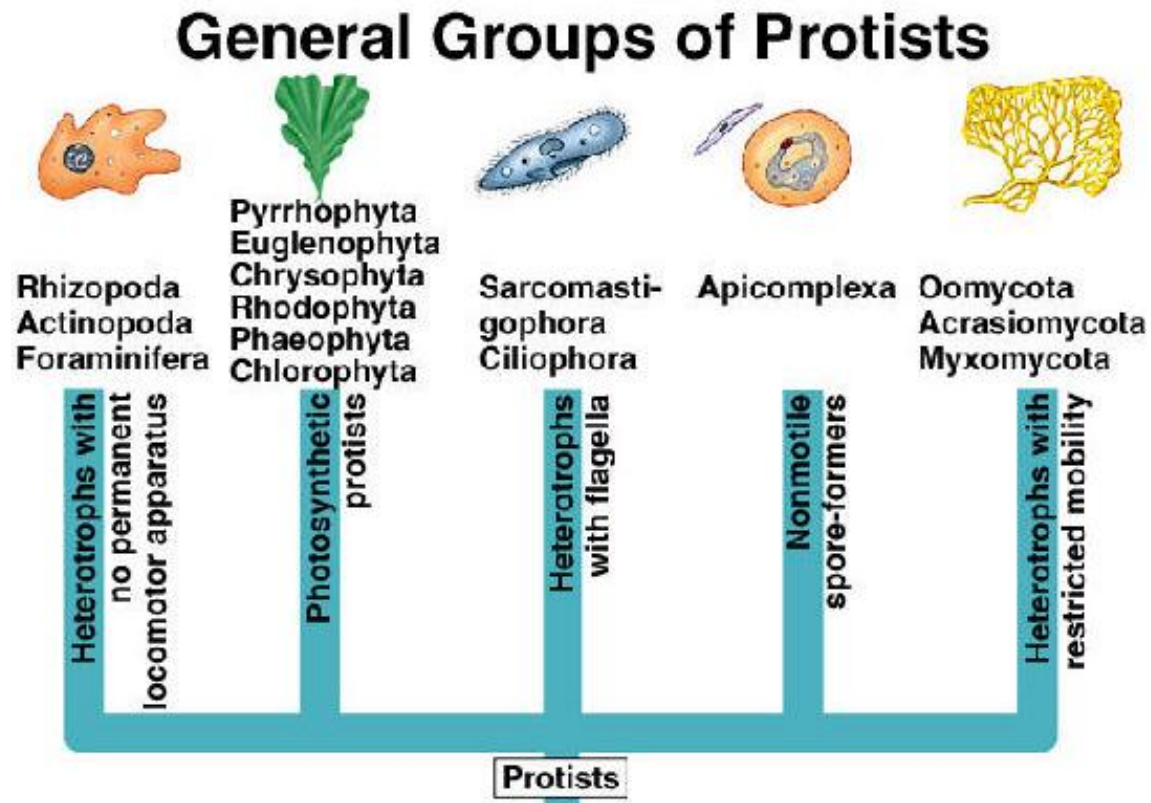
Not Necessarily a Kingdom

- Protists include phyla that have different ancestors (it's the catch all "kingdom")



How are protists grouped or classified?

- 3 categories: Primarily by the way they obtain food.



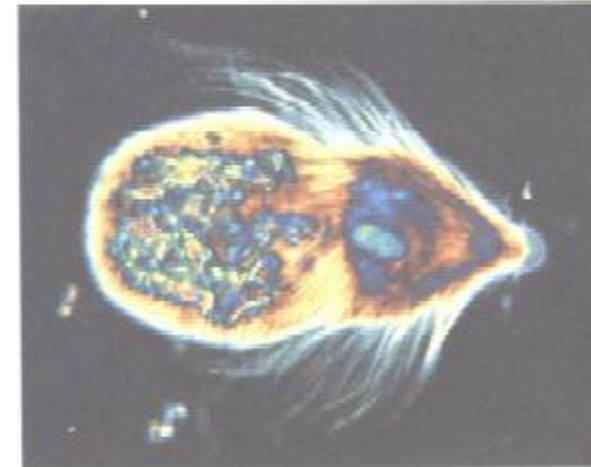
What are the three categories?

- First Category - Animal-like Protists
 - Heterotrophs
- Second Category - Plant-like Protists
 - Autotrophs
- Third Category - Fungus-like Protist
 - Decomposers (heterotrophs)

Ecology and Animal-like Protists

How are they important to the environment?

- Recycling nutrients by breaking down dead and decaying matter.
- *Symbiotic Relationships*
 - *Trichonympha* is a animal-like protist that lives in the gut of termites.
 - Breaks down wood for the termites.



Characteristics of Kingdom Fungi

1. Eukaryotic
2. Heterotroph – Decomposers
 - Absorb nutrients from surroundings
3. Unicellular (yeast) or multicellular (mold or mushroom)
4. Contains a cell wall made of chitin

Reproduction

Asexual

1. spores
2. fragmentation – piece breaks off and new fungus grows
3. budding – mitosis (yeast)

Sexual

1. conjugation – different mating types join together

Fungi Phyla

- Zygomycota – bread molds
- Basidiomycota – mushrooms
- Ascomycota – yeast, jock itch, ring worm

Symbiotic Relationships

- Mycorrhizae –fungus and plant roots
 - Helps absorb more nutrients for the plant
- Lichens –fungus and photosynthetic partner (cyanobacteria or green algae)
 - Partner provides food; fungus provides moisture, shelter and a way to anchor to things

Kingdom Plantae

- Nonvascular spore producers
- Vascular spore producers
- Vascular seed producers
 - Gymnosperms
 - Angiosperms
 - * Monots and Dicots

Characteristics of Kingdom Plantae

- Eukaryotic
- Multicellular
- Autotroph, rarely heterotroph
- Has cell walls – made of cellulose

Nonvascular – Spore producers

- 3 main phyla: mosses, liverworts, hornworts
- Vascular tissue: none
- Structure: short and no real root system (rhizoids), gets water through osmosis
- Environment: has to live near water or moist places
- Reproduction: Alternation of generations

Vascular – Spore producers

- 4 main phyla: whisk ferns, club mosses, horsetails, and ferns
- Vascular tissue: Yes
 - **xylem**: transports water and minerals
 - **phloem**: transports sugar made from photosynthesis
- Structure: most are larger and taller than non-vascular plants
- Environment: can live in drier areas
- Reproduction: Alternation of generations

Vascular – Seed producers (Gymnosperms)

- 4 main phyla: Cycads, Ginkgoes, Conifers, Gnetophytes
- Vascular tissue: xylem and phloem
- Structure: contain seeds found in cones
 - Seeds = contain seed coat, embryo, and food source
- Reproduction – sexual

Vascular – Seed producers (Angiosperms)

- 2 main phyla: Monocotyledons and Dicotyledons (Cotyledon = seed coat)
- Has fruit and flowers and is most complex type of plant
- Vascular tissue: xylem and phloem
- Structure: produces a fruit (ripened ovary) after pollen pollinates the egg
- Reproduction – sexual

Kingdom Animalia

- Characteristics
 - Eukaryotic
 - Multicellular
 - Heterotrophs
 - No cell wall
 - Lives on land and in water and most move around in some part of their life cycle

Two Divisions

- Invertebrates – does not have a back bone
- Chordates – subphylum Vertebrates
 - Contains a notochord = firm, flexible rod of tissue along back side of body
 - Becomes the discs between the vertebrae

Multicellular Organization and Reproduction

- Specialization – cells are adapted for specific functions and depend on other cells
- Cephalization – group of nervous tissue located in the front end of the organism
- Sexual – can reproduce asexually in same sex environments (Parthenogenesis)
 - Zygote – first cell formed when gametes join together

Characteristics Used to Group Animals

- Body symmetry
 - Radial symmetry – many similar parts can be divided from the center
 - Bilateral symmetry – 2 similar parts

Characteristics Used to Group Animals

- Germ Layers— tissue types found in embryos
 - Ectoderm – outside tissue that forms skin, hair, and nervous system
 - Mesoderm – middle tissue that forms skeleton, muscles, cardiovascular system
 - Endoderm – inside tissue that forms digestive system and respiratory system

Characteristics Used to Group Animals

- Body Cavity
 - Acoelomate – no body cavity
 - Pseudocoelomate – gut supported in fluid, not connected by other tissue
 - Coelomate – has tissue supporting the gut