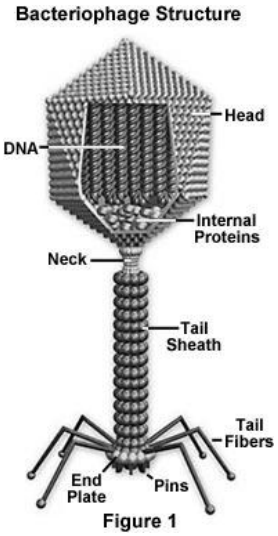


Figure 1

Chapter 15

Viruses and Microorganisms

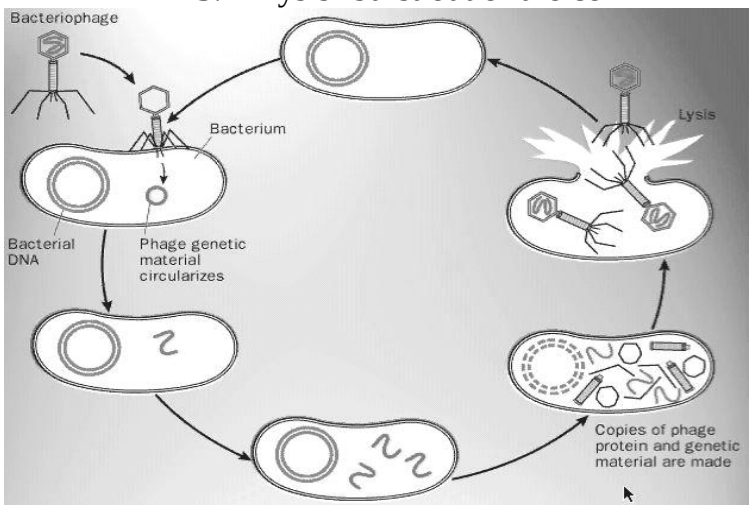
I. Viruses - Latin meaning poison

A. Structure

1. Protein coat
2. Nucleic acid inside
   a. Either DNA of RNA
3. So small they can't be seen with a light microscope
4. Must use an electron microscope
5. Shapes vary
6. Do not carry on life processes

B. Viral Cycles

1. Attach to cells
2. Reproduce in the cells using the cells energy and building materials
3. Lysis- burst out of the cell

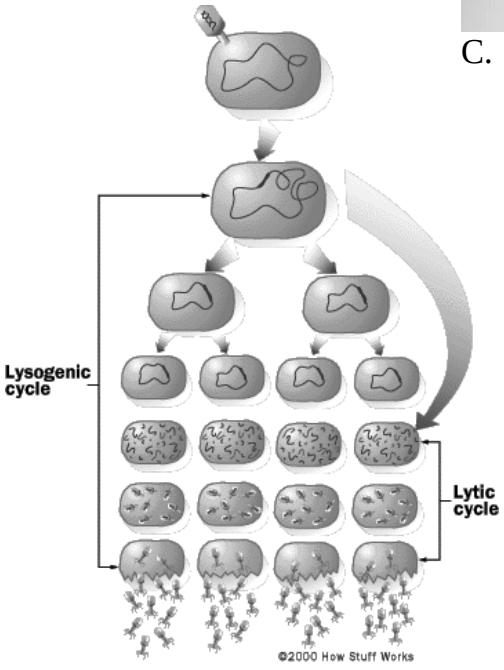


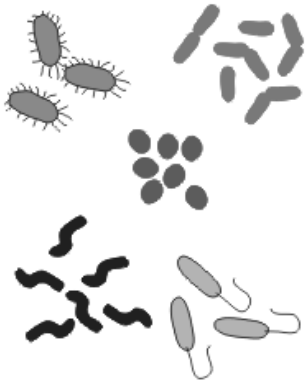
C. Lysogenic cycle

1. Cells lyse only after certain conditions
2. This type of virus is called a provirus

D. RNA viruses

1. Use reverse transcriptase to get into DNA code and use DNA bases to produce more viruses
2. Called retrovirus because of the backwards transcription that they do
   a. An example of this type of virus is AIDS and the common cold





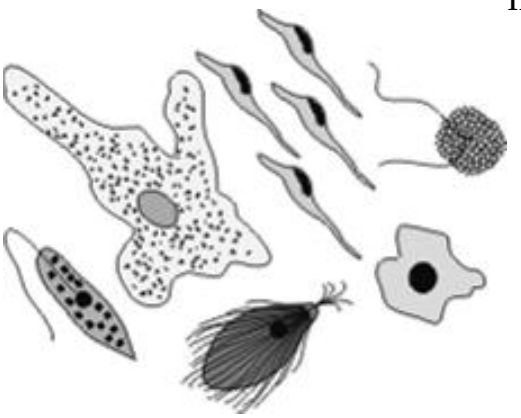
II. Kingdom Monera

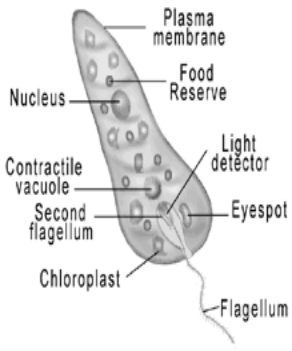
A. Characteristics
   1. prokaryotes
   2. no membrane bound organelles or microtubules
   3. cell walls of murein
   4. three basic shapes
      a. round – cocci
      b. rod – bacilli
      c. spiral – spirillia
   5. form endospores
   6. reproduction is asexual by binary fission

B. Bacteria nutrition
   1. Heterotrophs- include parasites, saprophytes and symbiotic
   2. Photosynthetic autotrophs
   3. Chemosynthetic autotrophs
   4. Thermosynthetic autotrophs

C. Ancient Bacteria –nutrition different from true bacteria
   1. Methane producers
   2. salt loving
   3. Heat and acid loving

D. The importance of bacteria





III. Kingdom Protista

A. Characteristics
   i. Eukaryotes
   ii. Autotrophic, Heterotrophic or both
   iii. Divide into three groups
      1. Plantlike
      2. Animal like
      3. Fungi like

B. Plant like protists - Classified according to color and structure
   i. Euglenoids – Phylum Euglenophyta
      1. Characteristics of both plants and animals
      2. Like animals they lack cell walls and move by flagella
      3. Like plants they are photosyntheric and have chloroplasts
      4. Can be both heterotrophic and autotrophic
   ii. Golden Algae, Phylum - Chrysophyta
      1. Yellow green to golden brown

2. Diatoms
    a. Two part outer shell
    b. Shell is glass like
    c. Shell deposits left behind called diatomaceous earth

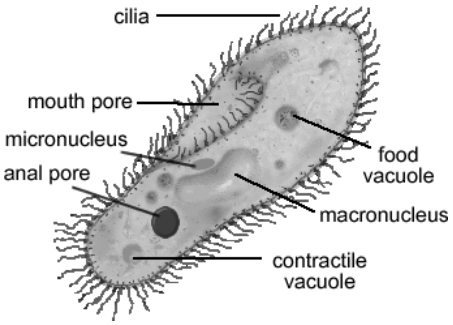
iii. Green Algae – Phylum Chlorophyta
1. Have pigment chlorophyll
2. Include spirogyra, volvox, ulva, chlamydomanas, chlorella

iv. Brown algae – Phylum phaeophyta
1. Examples: Sargassum, Kelp
2. Used as food conditioners and in cosmetics

v. Red Algae - Phylum Rhodophyta
1. Deepest sea producers
2. Used in food and bio lab

C. Animal like Protists- Protozoa are *classified by movement*

i. Rihzopods – Phylum Rhizopoda
1. Move by pseudopodia
2. Examples: Amoeba, Forams, Radiolaria
3. Move by amoeboid movement



ii. Ciliates - Phylum Ciliophera
1. Move by hair like cilia on the surface
2. Unicellular with stiff covering called a pellicle
3. Example: paramecium
    a. Have two nuclei
        i. Micro nucleus – involved in reproduction
        ii. Macro nucleus – Cells basic activities
4. Reproduce by Conjugation and cell division
5. Oral grove to ingest food

iii. Flagellates – Phylum Zoomatigina
1. Move by flagella
2. Some are parasites
    a. Trypansoma- African sleeping sickness transmitted by tsetse fly
3. Some are mutualistic
    a. Example: Flagellates in the digestive system of a termite

iv. Sporozoans – Phylum Sporozoa

1. No
   means of movement and reproduce by means of a spore like structure
2. Most are parasitic and some cause disease
    a. Plasmodium causes malaria – transmitted by mosquitoes, 1 million *Homo sapiens* die /year

D. Fungus like protists – Phylum Myxomycota
   i. Slime molds – have a unique life cycle
      1. Plasmodium – slimy yellowish mass takes in food by phagocytosis as it oozes
      2. Fruiting bodies develop when food or moisture decrease
          a. Produce spores by mitosis
      3. Swarm cells develop from spores
          a. These cells are flagellated
      4. Swarm cells fuse and begin plasmodium stage
      5. Fruiting bodies like fungi, plasmodium and swarm cells are like protozoa

IV. Kingdom Fungi
   A. Characteristics
      i. Sessile
      ii. Heterotrophic – parasite or saprophyte
      iii. Most have stalk called hyphae
          1. A mass of hyphae together is called mycelium
      iv. Reproduce by spores
      v. Cell wall made of chitin
      vi. Named on basis of spore producing structures
   B. Fungi Phyla – mycota means fungus
      i. Zygote fungi – Phylum Zygomycota
          1. Hyphae can fuse to form a zygote
          2. Also called sporangium fungi because their spores are produced in the sporangia on tip of hyphae
          3. Stolons – hyphae that spread along the food source
          4. Rhizoids – anchor the food source and produce enzymes that break down substrate
          5. Both saprophytes and parasites in this phylum
          6. Bread mold fit into this phylum

fungi

ii. Club Fungi – Phylum Basidiomycota
    1. Spore producing structure is club shaped and called basidia (club)
    2. Club fungi include shelf fungi. Rusts, smuts, puffballs and mushrooms
    3. Mushroom
        a. Stipe – stalk – mycelium
        b. Cap – umbrella like structure
        c. Gills – basidia within

iii. Sac Fungi – phylum Ascomycota
    1. Ascus – sac like spore producing structure
    2. Group includes, yeasts, penecillium, powdery mildews, morels, Dutch elm disease

V. Lichens – Combination of fungi and algae
    A. Algae are the producers and fungi provide protection and moisture
    B. Can live in places where neither Fungi or alga can live
    C. Mutualistic relationship