

GENERAL BIOLOGY Lecture 20 - Viruses, Monerans*, and Protistans

I. Overall scheme to evolution - important because it helps us understand life

Note that viruses are defined as non-living

Monerans* =====> Protistans =====> Fungi
 (bacteria) (single celled) Plants
 ----- "microbes" ----- Animals

From single cells =====> multicelled organisms
 with division of labor

II. Viruses - important because of their role in disease and biotechnology

- A. They are not alive, but do affect the 5 (or 6, depending on the classification system) kingdoms
- B. Characteristics of viruses
 - 1. Nucleic acid core (DNA or RNA) surrounded by a protective protein
 - 2. Replicates only after genetic material enters a specific host
- C. Structure of a virus (T4 Phage)
 - 1. Head - has DNA with protein coat
 - 2. Sheath
 - 3. Tail fibers
- D. Examples of important viruses
 - 1. RNA viruses
 - a) Rhinoviruses - common colds
 - b) Influenza viruses - cause worldwide epidemics (winter flu, Asian flu, etc.)
 - c) Retroviruses - tumors, leukemia, and AIDS
 - 2. DNA viruses
 - a) Herpes viruses - fever blisters (type I) and genital infections (type II)

III. Monerans - prokaryotic

- A. Bacteria are the sole members of the Kingdom Monera*
 - 1. *E. coli*, *Streptococcus*, *Staphylococcus*, blue-green algae
- B. Characteristics of bacteria
 - 1. Prokaryotic
 - 2. Have a single chromosome
 - 3. Most have a cell wall composed of peptidoglycan
 - 4. Most reproduce by binary fission
 - 5. Bacteria show metabolic diversity
- C. Types of bacteria
 - 1. Photosynthetic autotrophs - use sunlight as energy to drive synthesis of biological molecules
 - 2. Chemosynthetic autotrophs - use simple inorganic compounds as energy source to drive synthesis of organic molecules
 - 3. Heterotrophs (majority of bacteria) - like us - rely on other organisms to obtain food energy

IV. Protistans - single-celled eukaryotes

- A. Examples
 - 1. Slime mold - moves along decaying logs, twigs, etc., engulfing food
 - 2. Euglenids - little organisms found in lakes, etc. and have a flagellum
 - 3. Protozoans - highly motile predators or parasites
 - 4. Green algae, brown algae, golden algae, red algae

**The Kingdom Monera, under the new classification scheme, has been divided into the Kingdoms Archaeobacteria and Eubacteria*