Medical Biology

Lecture one

Biology and its branches

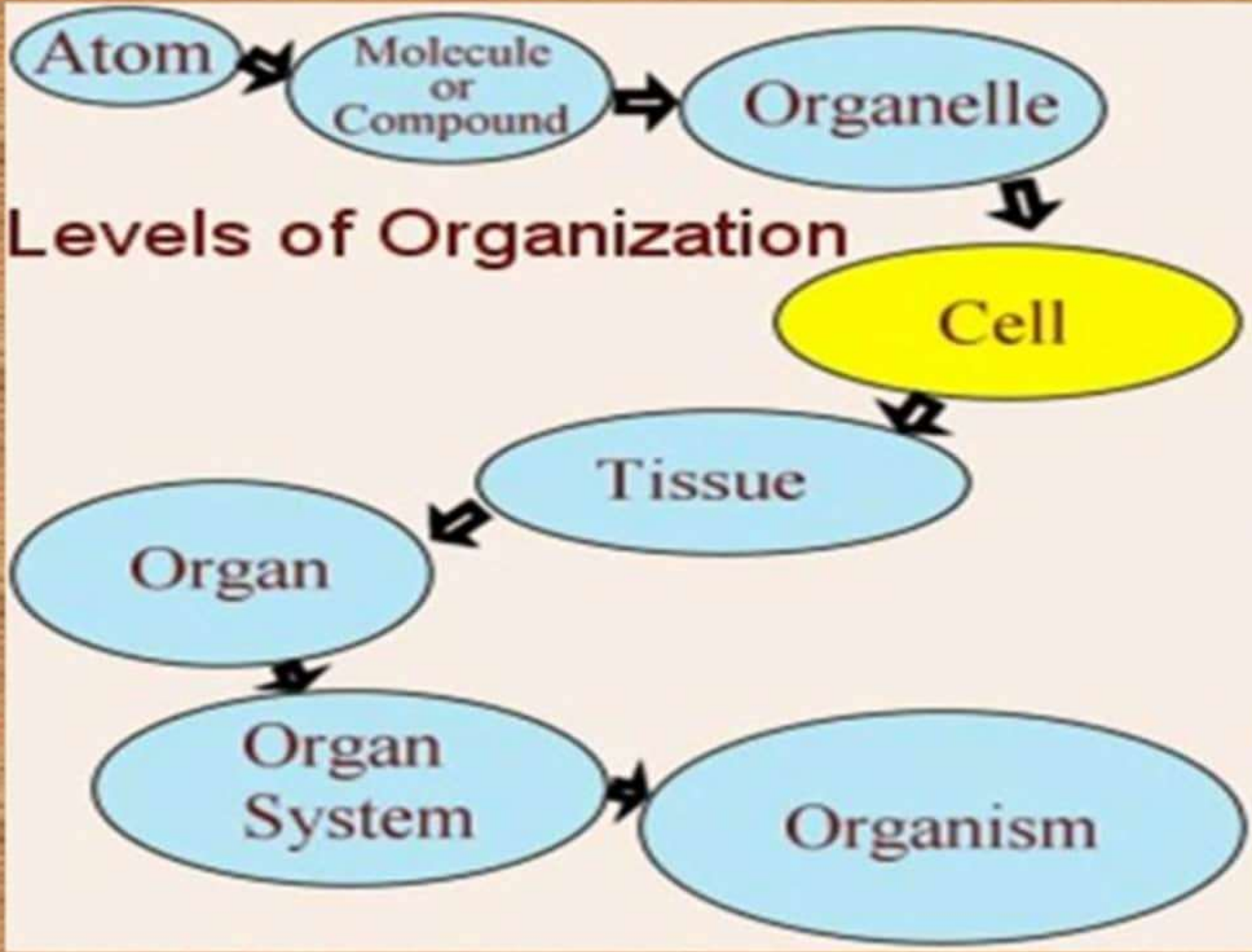
BIOLOGY AND ITS BRANCHES

BIOLOGY

- Biology is a natural science concerned with the study of life and living organisms, including their structure, function, growth, evolution, distribution, and taxonomy.

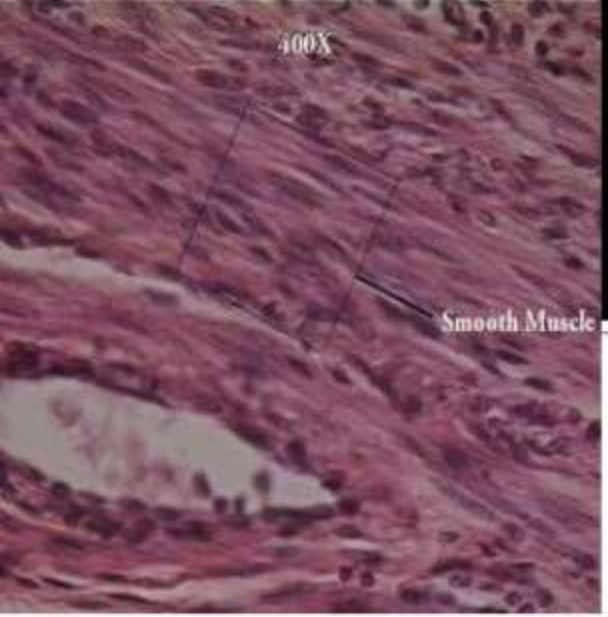
- Biology generally recognizes the cell as the basic unit of life, genes as the basic unit of heredity, and evolution as the engine that propels the synthesis and creation of new species.

- The term biology is derived from the Greek word bios, "life" and the suffix -logia, "study of."

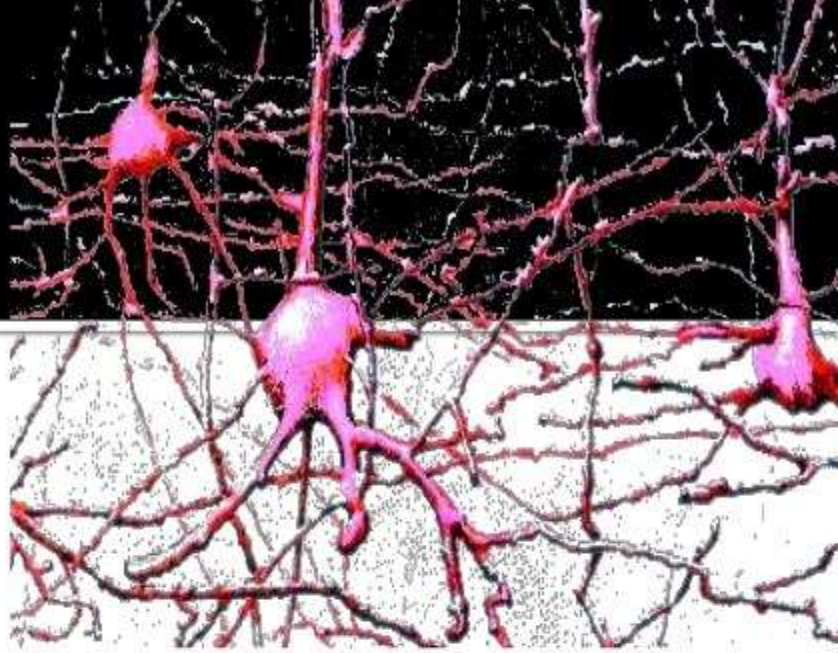

Atom
Molecule or Compound
Organelle
Levels of Organization
Cell
Tissue
Organ
Organ System
Organism

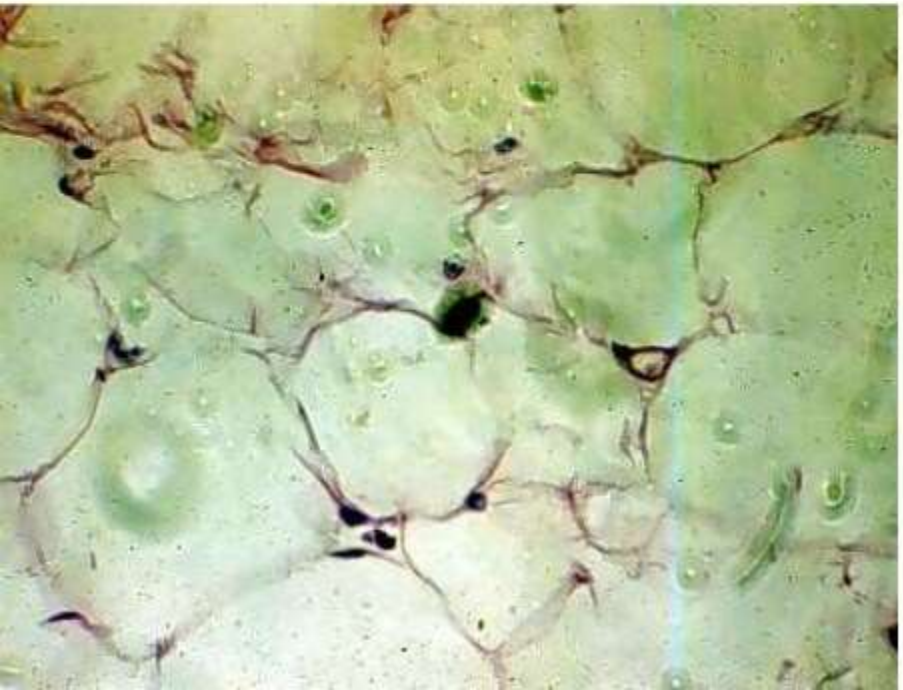
Cells

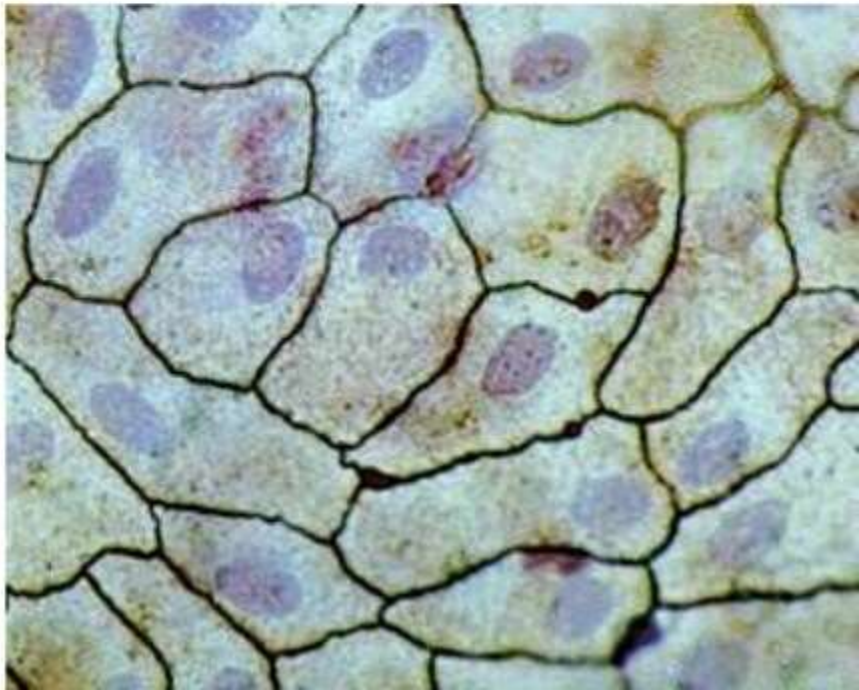
- A **cell** is the most basic unit of structure



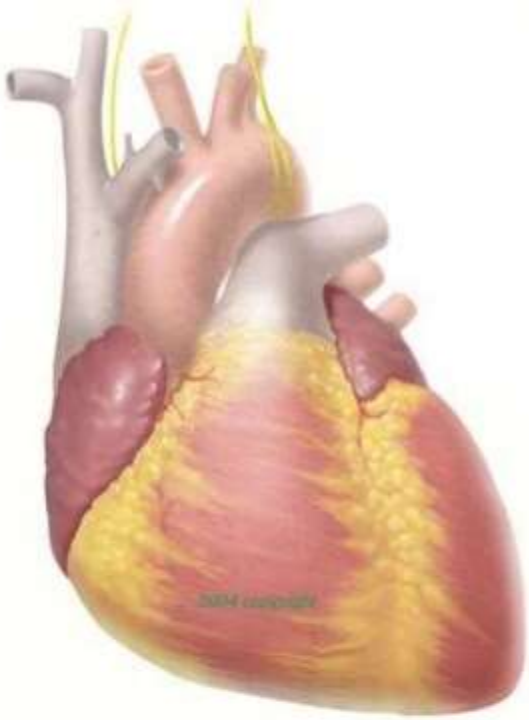
Tissues

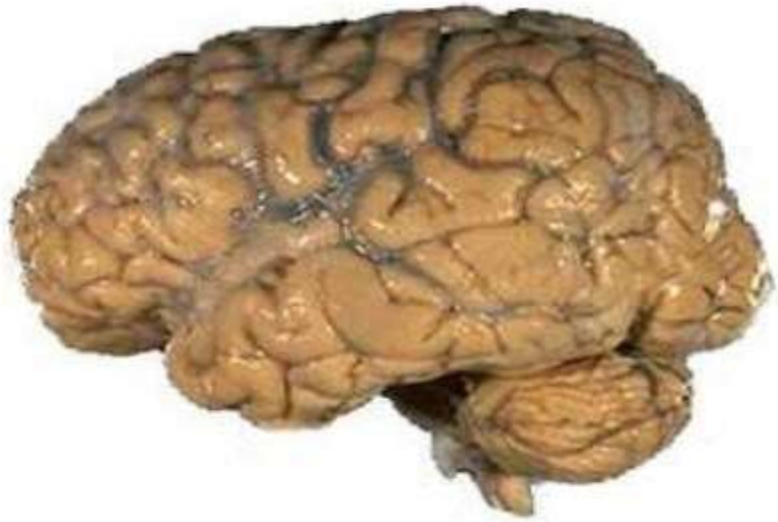


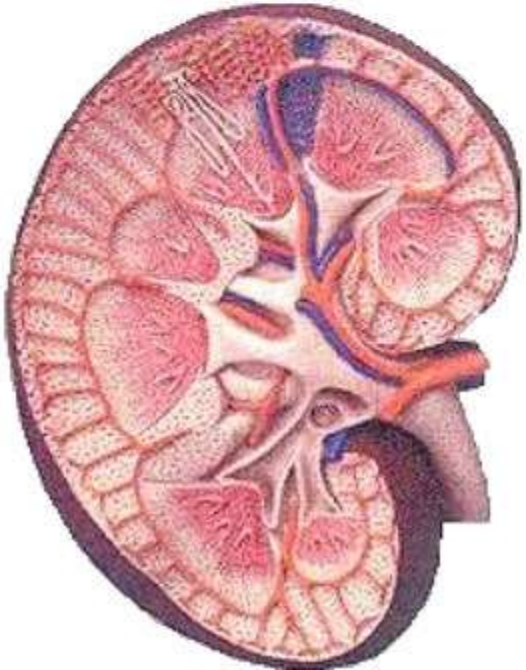


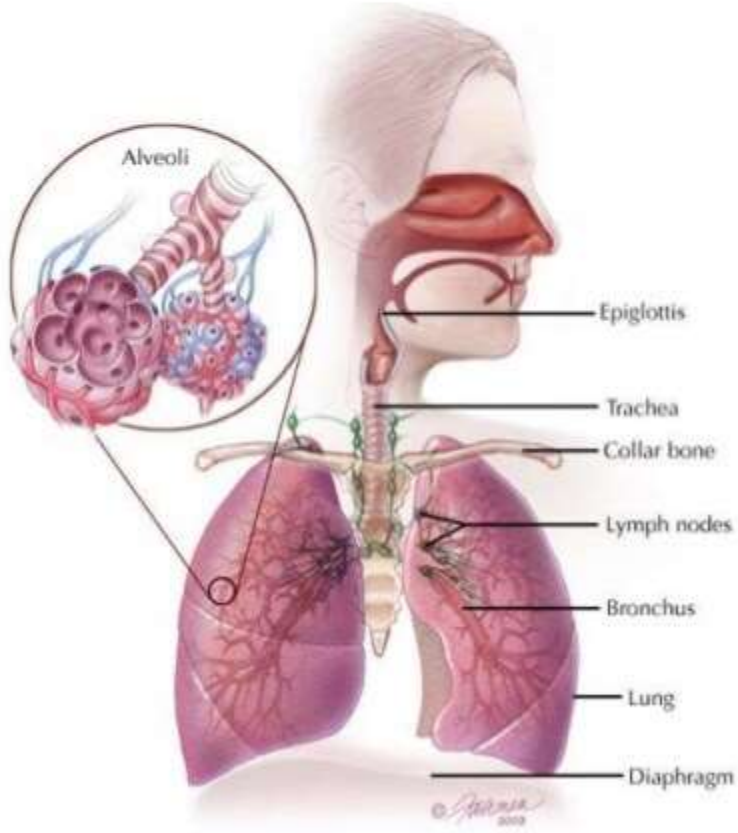


Organs








Alveoli
Epiglottis
Trachea
Collar bone
Lymph nodes
Bronchus
Lung
Diaphragm

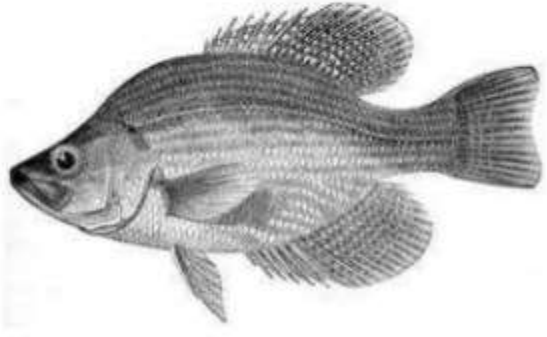
Classification of Living Things

What is classification?

- Classification is the grouping of living organisms according to similar structures and functions.

Early classification systems

- Aristotle grouped animals according to the way they moved



The modern classification system :

Developed by Carolus Linnaeus

Consists of 7 levels:

- Kingdom
- Phylum
- Class
- Order
- Family
- Genus
- Species

FIVE KINGDOMS

- **Monera** are single-celled organisms that don't have a nucleus. Bacteria make up the entire kingdom. There are more forms of bacteria than any other organism on Earth. Some bacteria are beneficial to us, such as the ones found in yogurt. Others can cause us to get sick.

- **Fungi** are usually motionless organisms that absorb nutrients for survival. They include mushrooms, molds, and yeasts.

- **Protists** are mostly single-celled organisms that have a nucleus. They usually live in water. Some protists move around, while others stay in one place. Examples of protists include some algae, paramecium, and amoeba.

- **Plants** contain chlorophyll, a green pigment necessary for photosynthesis, a process in which plants convert energy from sunlight into food. Their cell walls are made sturdy by a material called cellulose, and they are fixed in one place. Plants are divided into two groups: flower- and fruit-producing plants and those that don't produce flowers or fruits. They include garden flowers, agricultural crops, grasses, shrubs, ferns, mosses, and conifers.
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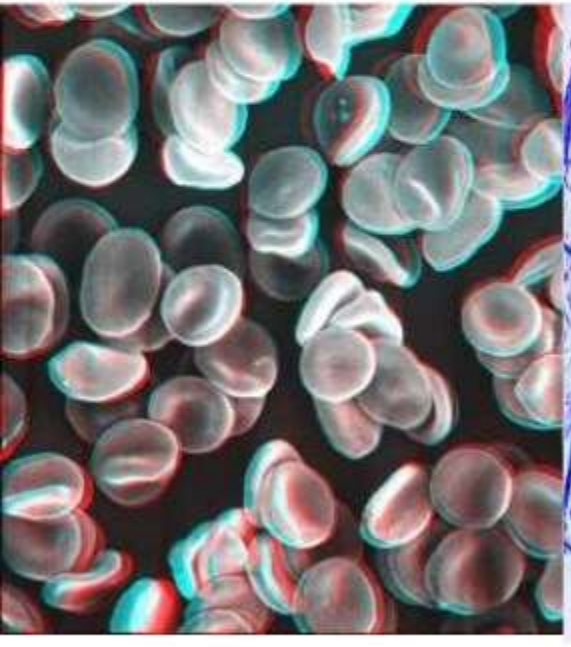
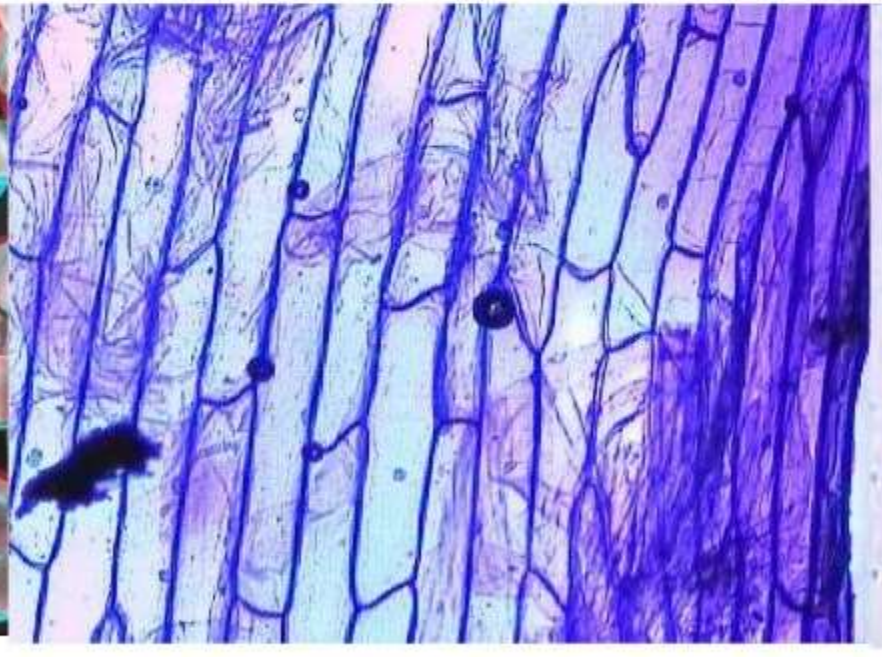
- **Animals** are the most complex organisms on Earth. Animals are multi-celled organisms, eat food for survival, and have nervous systems. They are divided into vertebrates and invertebrates and include mammals, amphibians, reptiles, birds and fish. Actually, there are now six kingdoms. The five kingdom was during the 1969 and it included all the bacteria within one group.

Characteristics of Living Things

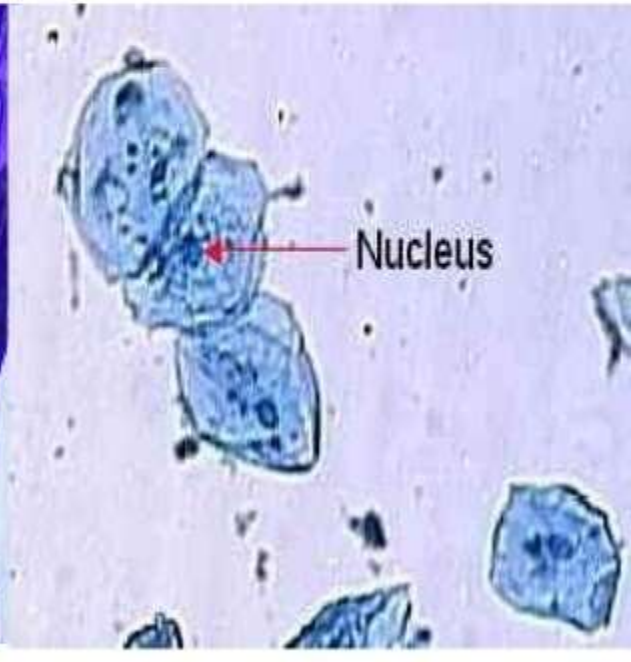
1. Made of Cells



Red Blood cells



Onion skin epidermal cells



Human cheek cells

Characteristics of Living Things

2. Grows and develops

- Increase in cell size and/or number
- Includes: development, aging, death
- Differentiation – cell specialization for a certain job

Characteristics of Living Things

3. Obtains & uses Energy

4. Reproduces

5. Responds to the Environment
    a. Movement – internal or external
    b. Irritability - ability to respond to a stimulus

BRANCHES OF BIOLOGY

Biology is simply the study of life.

- Biology is concerned with all living things.
- There are many branches of biology.
- Every one is study of a group of organism.

ZOOLOGY

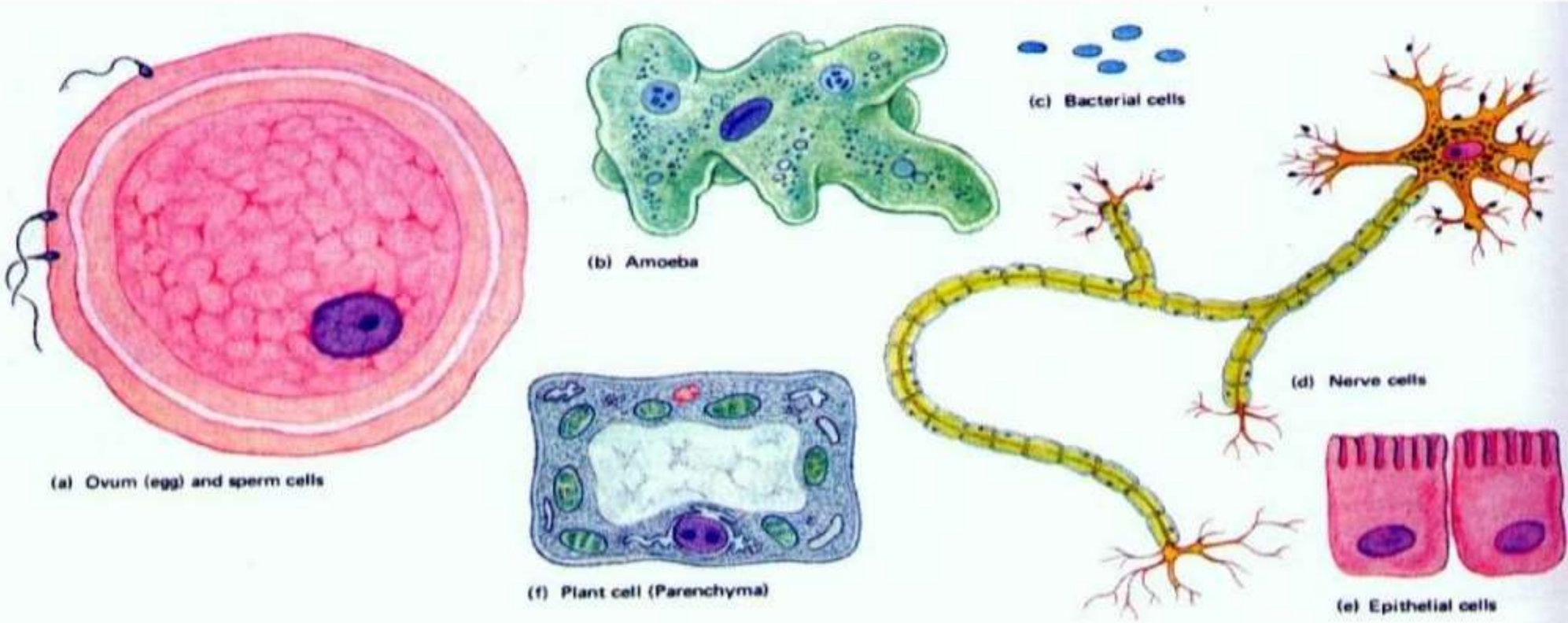
- Zoology is concerned with animals
- Who does make the observation about zoology is called Zoologist.

BOTANY

- Botany is concerned with plants
- Who does make the observation about the botany is called Botanist.

CYTOLOGY

- Cytology is the study of cells.



ECOLOGY

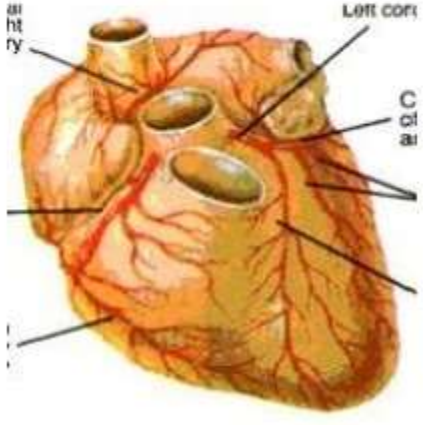
- Ecology is the science which studies the releationship of living things between each other and their environment.
- Also ecology is concerned with pollution. Such as air and water pollution

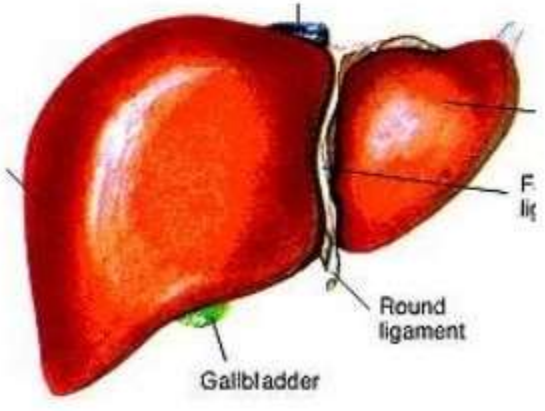
GENETICS

- Genetics is the study of how features is passed to offspring from their parents.

ANATOMY

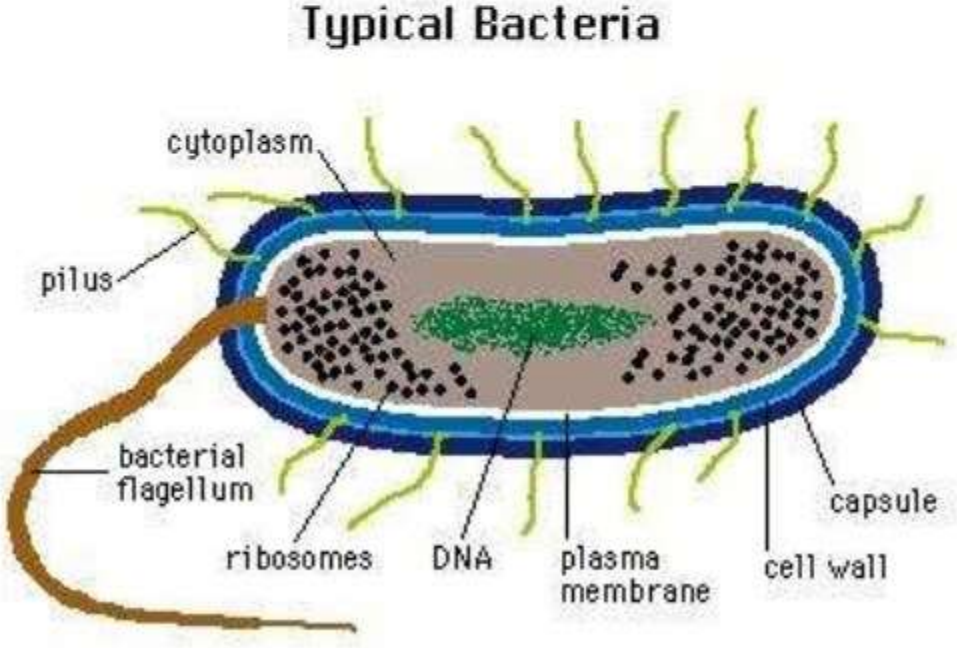
- Anatomy is the study of the inner organs of the body (kidney, hert, liver etc.)





MICROBIOLOGY

- Microbiology is the study of microscopic life.
- For ex. Bacteria.



taxonomy

- Taxonomy is the study of the classification of living organisms.
- Classification is made groups of organisms.

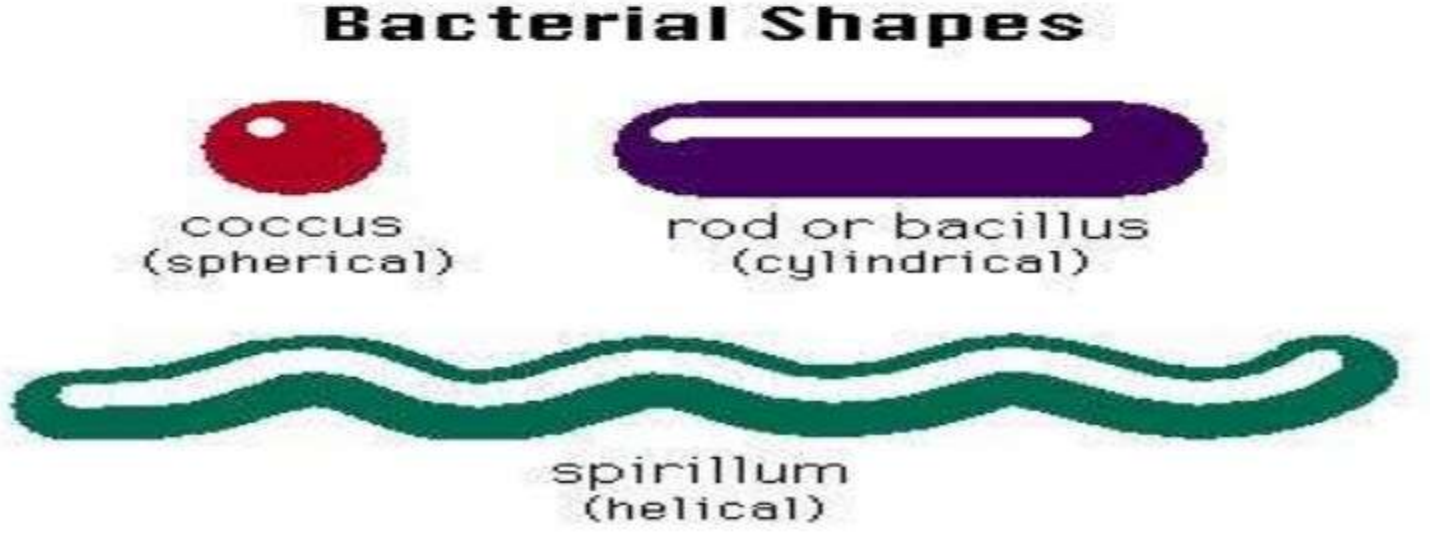


Parasithology

- Parasithology is the study of parasites.
- Parasites are harmful organisms for living things.

BACTERIOLOGY

- Bacteriology is the study of bacteria

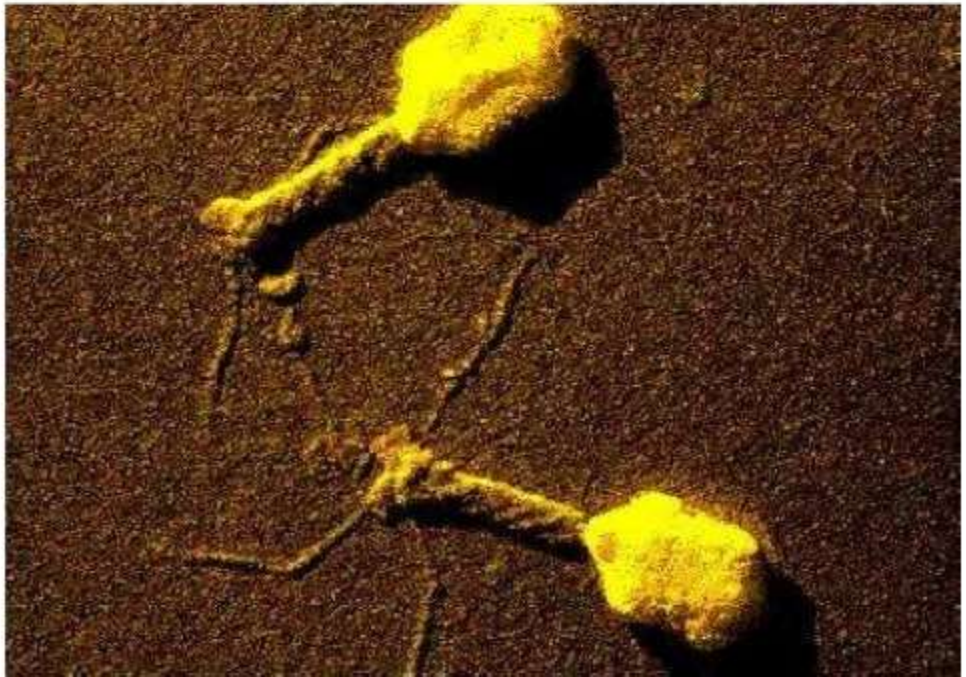


Mycology

- Mycology is the study of fungi.

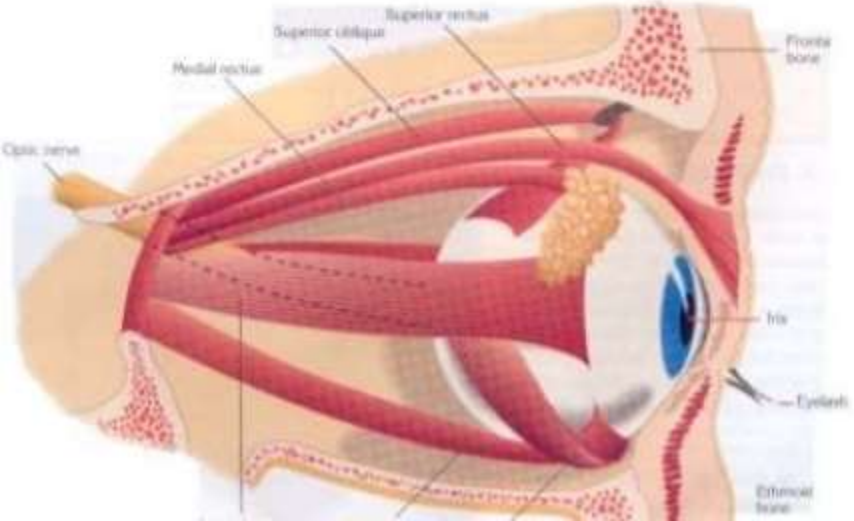
virology

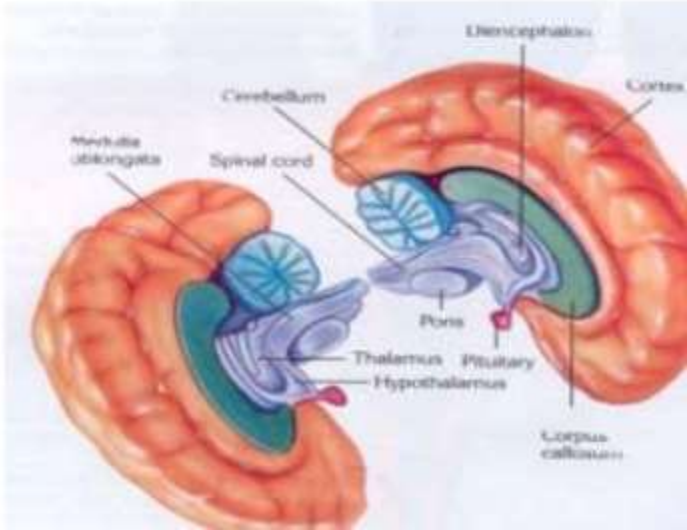
- Virology is the study of viruses.



Physiology

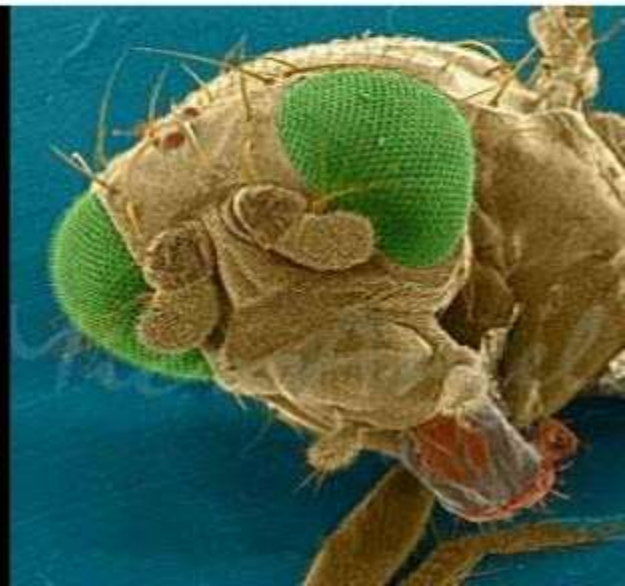
- Physiology is concerned function of tissue, organs and systems.





morphology

- Morphology is concerned with phenotype (Apearance) of living things.



Embryology

- Embryology studies the developmental patterns of organisms from zygote to birth.