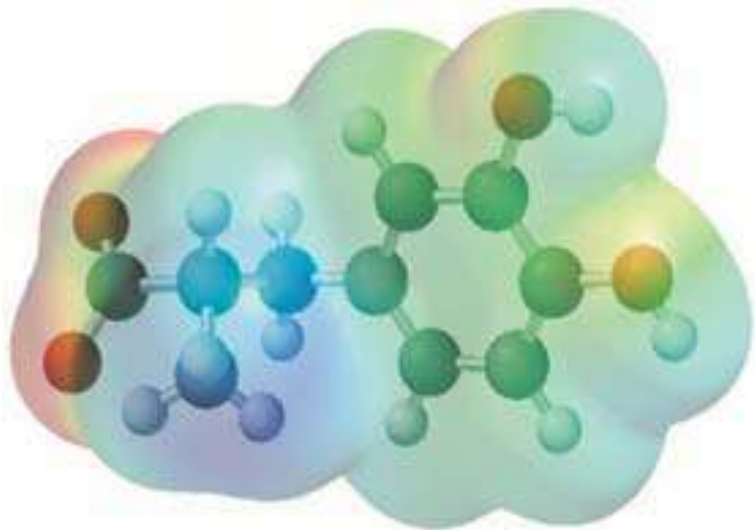
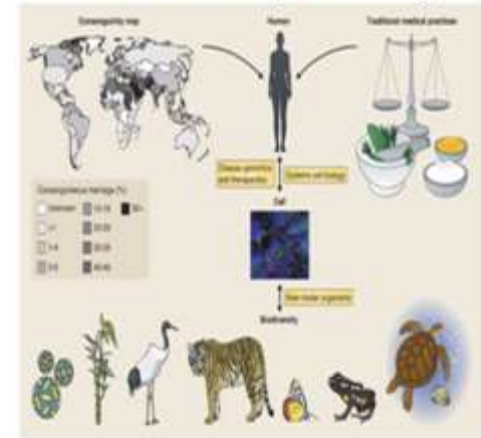


First Lecture in Biochemistry

2015-2016



Expanding the geographical distribution of research activities will broaden the scope of cell biology.



JCB

For 2stage
D.Ehssan Alobaidy

Introduction and Defined:

Biochemistry:

-Defined as the science concerned with the chemical basis of life (**Gk bios “life”**).

-The cell is the **structural unit** of living systems.

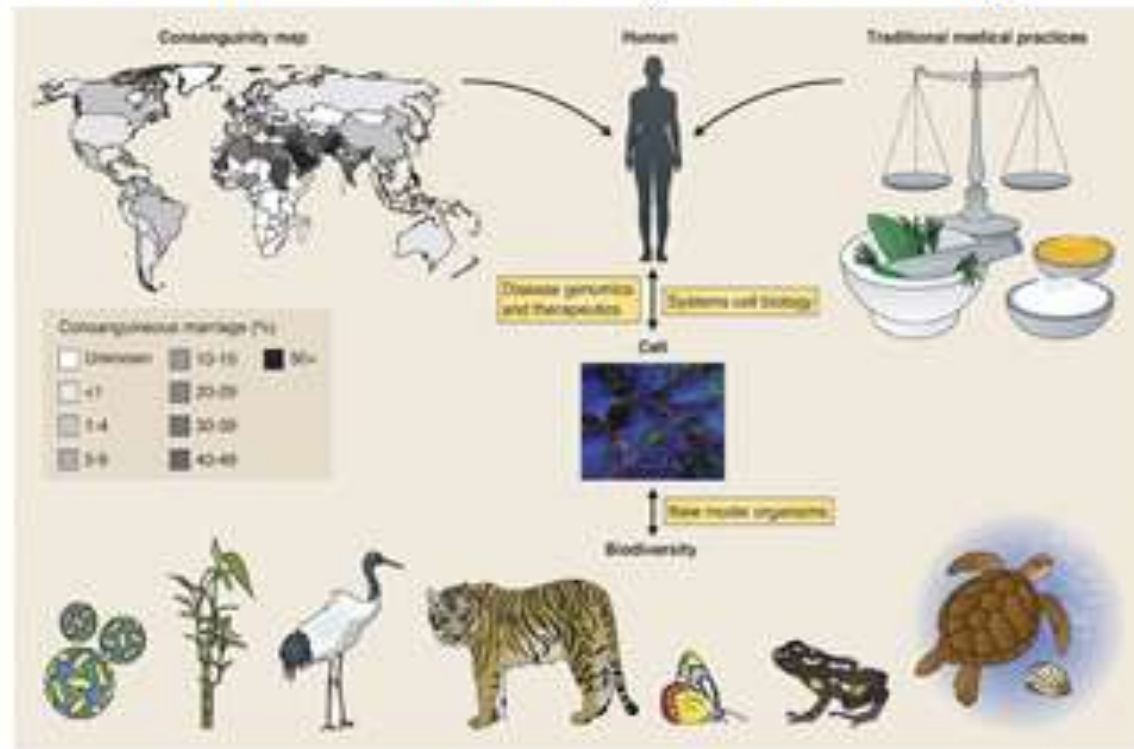
-Biochemistry can also be described as the science concerned with the chemical constituents of living cells and with the reactions and processes they undergo.

-By this definition, Biochemistry encompasses large areas of cell biology, of molecular biology, and of molecular genetics.

Biochemistry science

- **The science deals with in chemical natural of biological cell, and all biochemical reactions that take place in organelles in Human or Animal or Plant body.**
- **Biochemistry-subjects divided :Qualitative (composition of Biochemical molecules) and Kinetic (Metabolism).**
- *Molecules of life (Biomolecules):important elements C, N,H,O,P,S this elements in molecules of biological organelles.*
- **Amino acids, Saccharides, Fatty acids, Purines Pyrimidines , nucleotides, its considered as structural unites for Proteins and carbohydrates, Lipids, and nucleic acids.**

Expanding the geographical distribution of research activities will broaden the scope of cell biology.

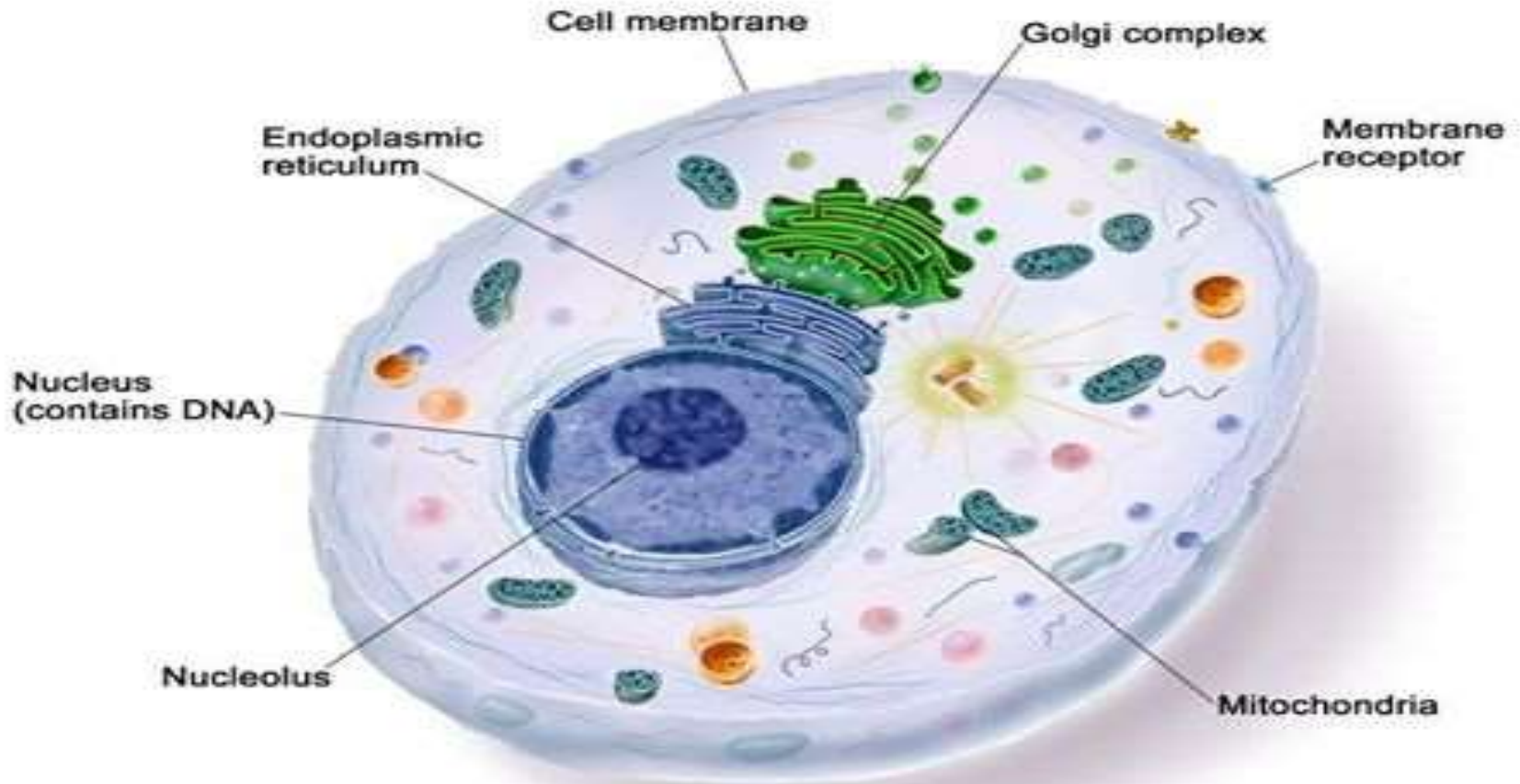


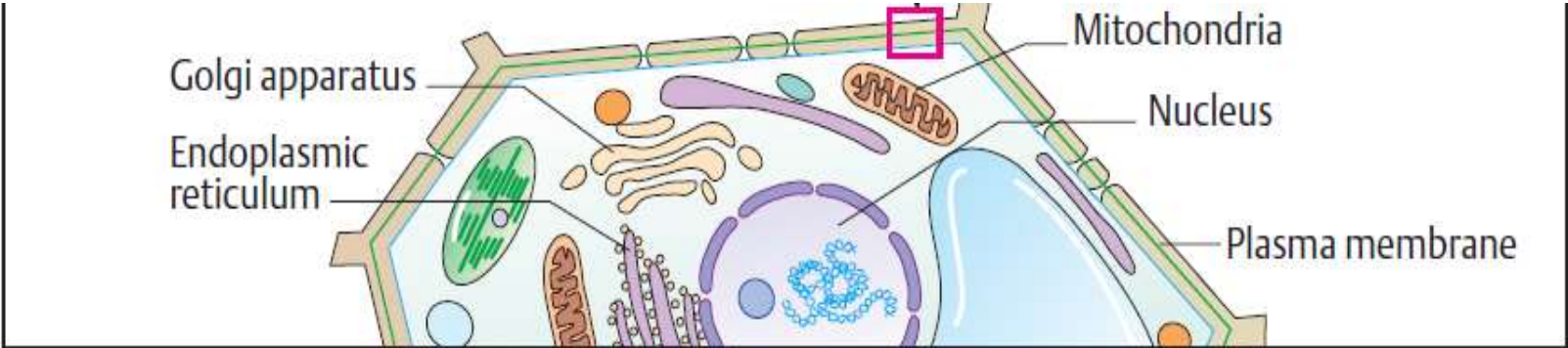
Biochemical Cell

- **Divide according to size and composition to:**
 - **1- Prokaryotic 2- Eukaryotic.**
- **Prokaryotic:** Its very small and simple composition . have one simple membrane and without nucleus and without organelles, and one chromosome. This kinds of cells in Bacteria and Parasites.
- **Eukaryotic:** this second type and bigger than the first and more complex 1000-10000 This cell contained cell membrane and another membranes surrounded the nucleus and organelles in the cell, and have more to much chromosomes this kind in humans and animals and plants.
- **Plant cell :**as animal cell as well as contain Chloroplasts and surrounded with by strong well as cellulose.
- **Pancreatic cell :**as animal cell this kind specific to produce a big quantities , Enzymes that help in digestion process. And this type has more mitochondrion.

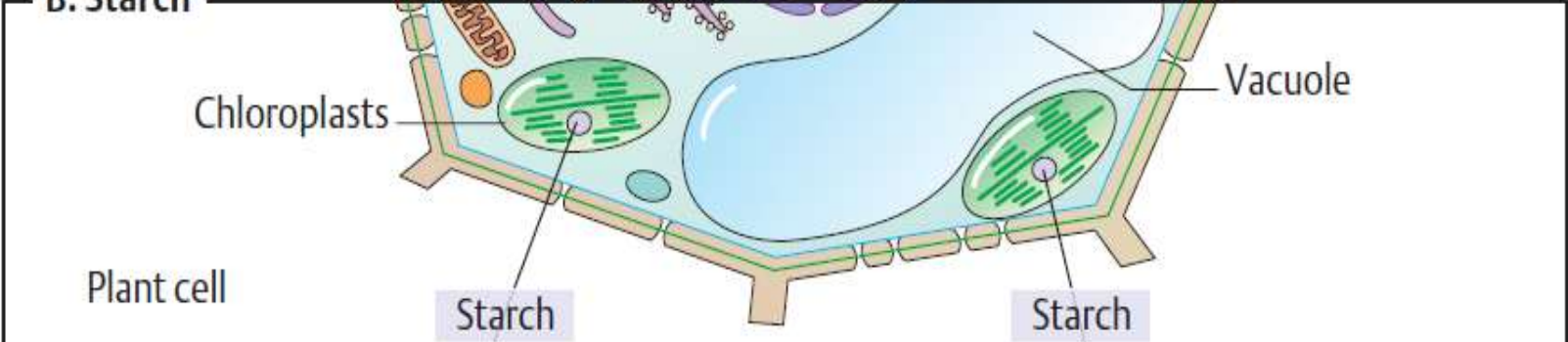
The Cell

Parts of a Cell



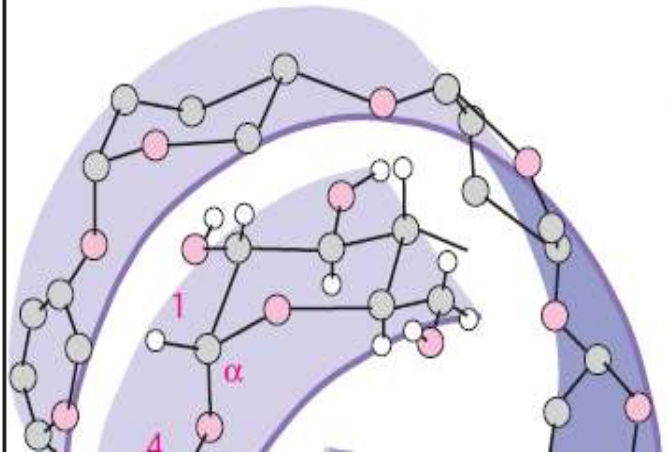


B. Starch

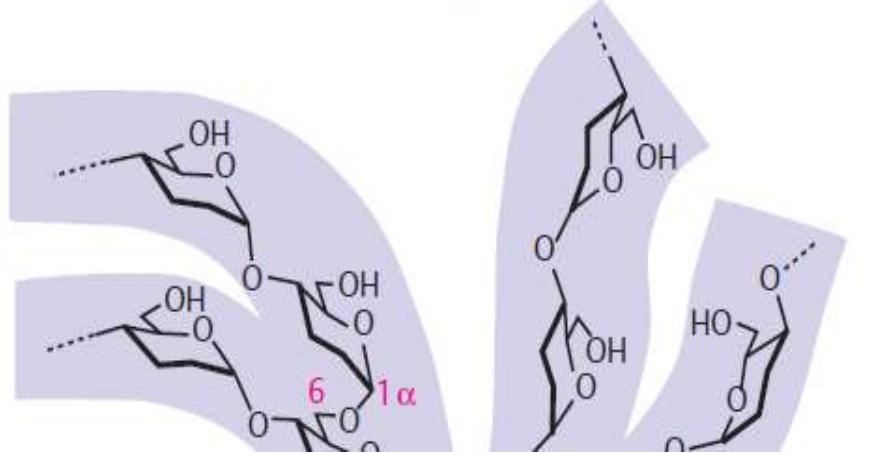


Plant cell

1. Amylose 20%



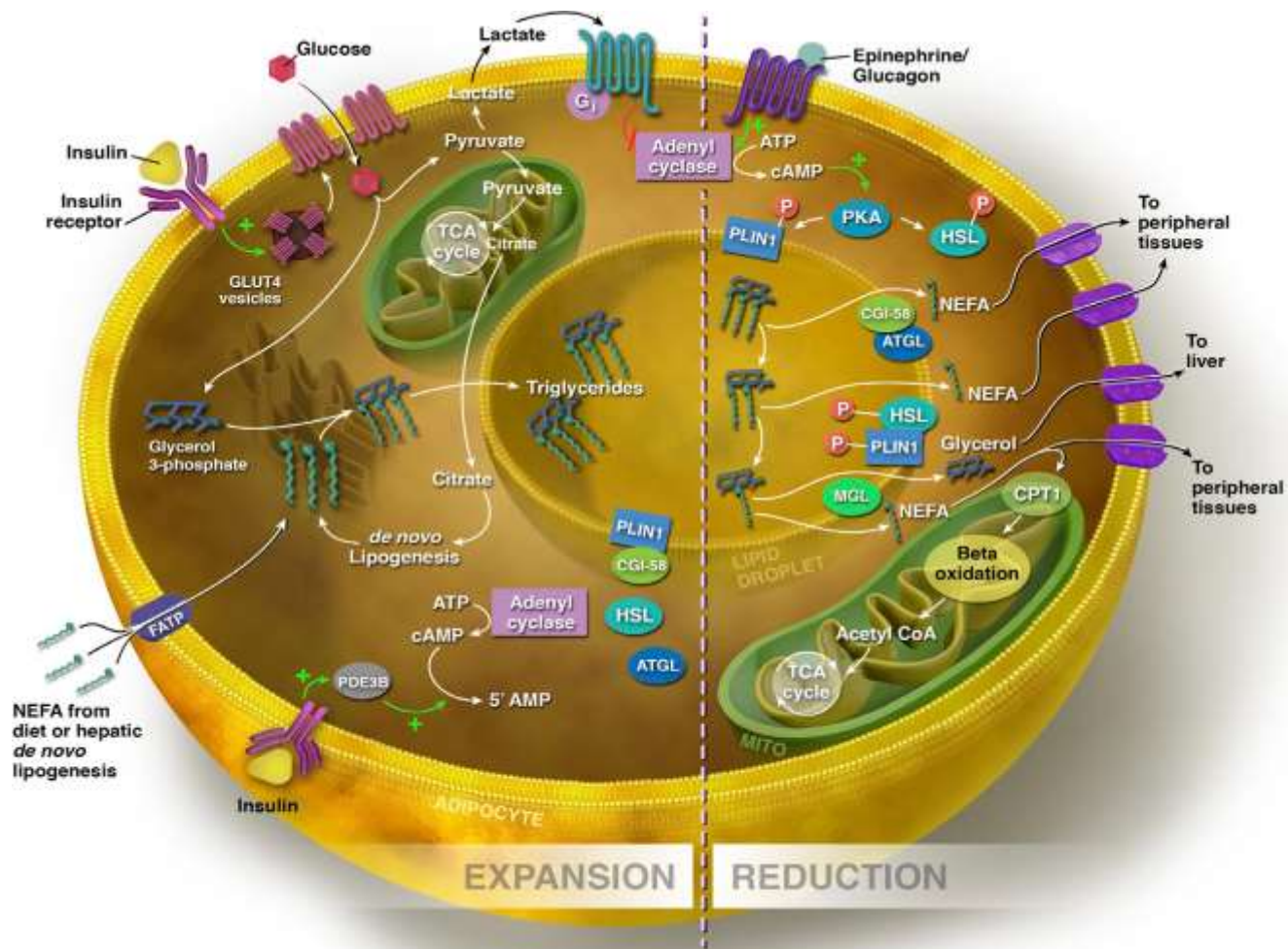
2. Amylopectin 80%



Cell Components of

- Cell membrane,
- Mitochondria,
- Cytoplasm,
- Nucleus,
- Micro body,
- Endoplasmic reticulum and ribosomes,
- Golgi bodies,
- Lysosomes,
- Vacuoles.

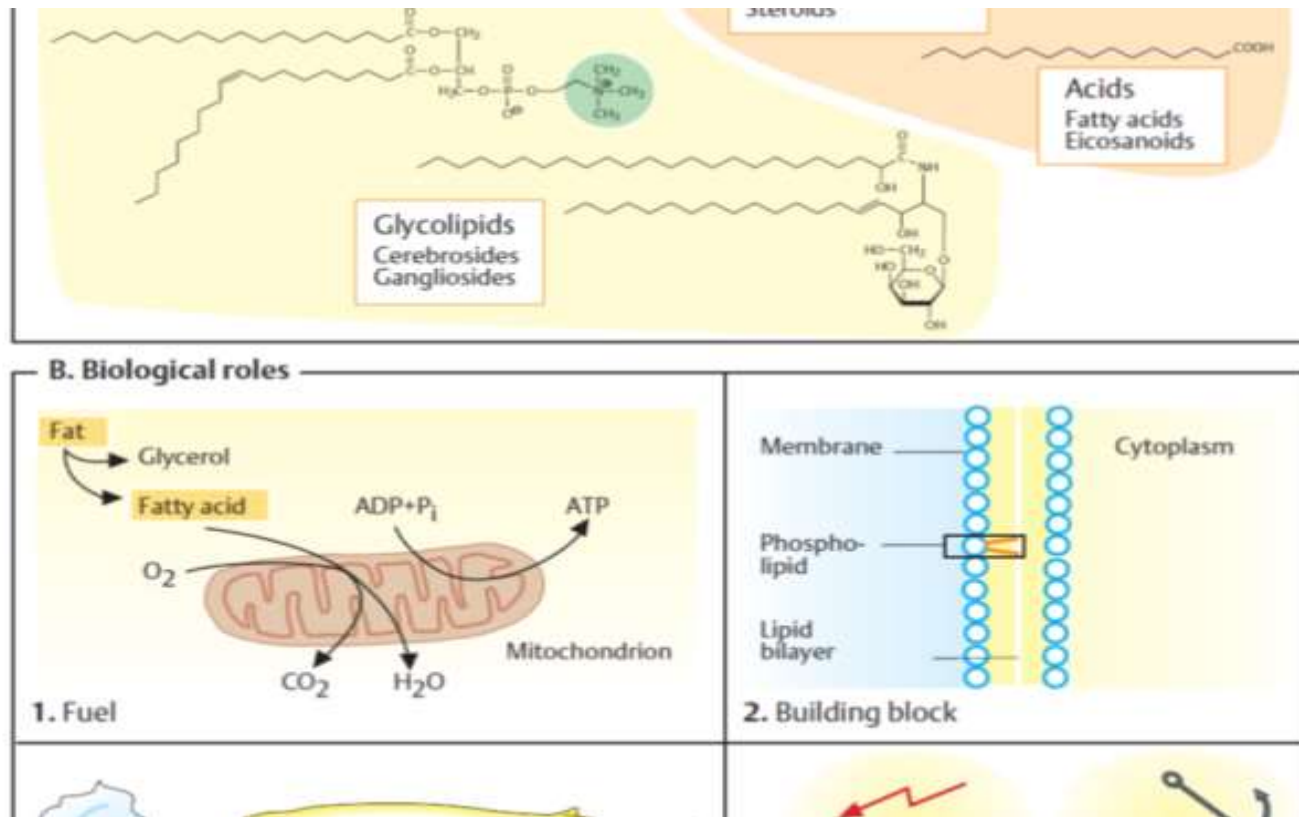
The Biochemistry cell



Cell membrane

Surrounds the cell and it plays an important role in passing materials and wastes into and out of the cell.

Called **Plasma Membrane**, composed from **Protein complex and Phospholipid**, it's important in **Active transport** (because out of cell to much Na, Cl and K) but in cell much of K but few from Na, Cl.



- **Cytoplasm**

- It's the Protoplasmic Mass that have all Cell components and all big molecules as well as Enzymes.

- **Nucleus**

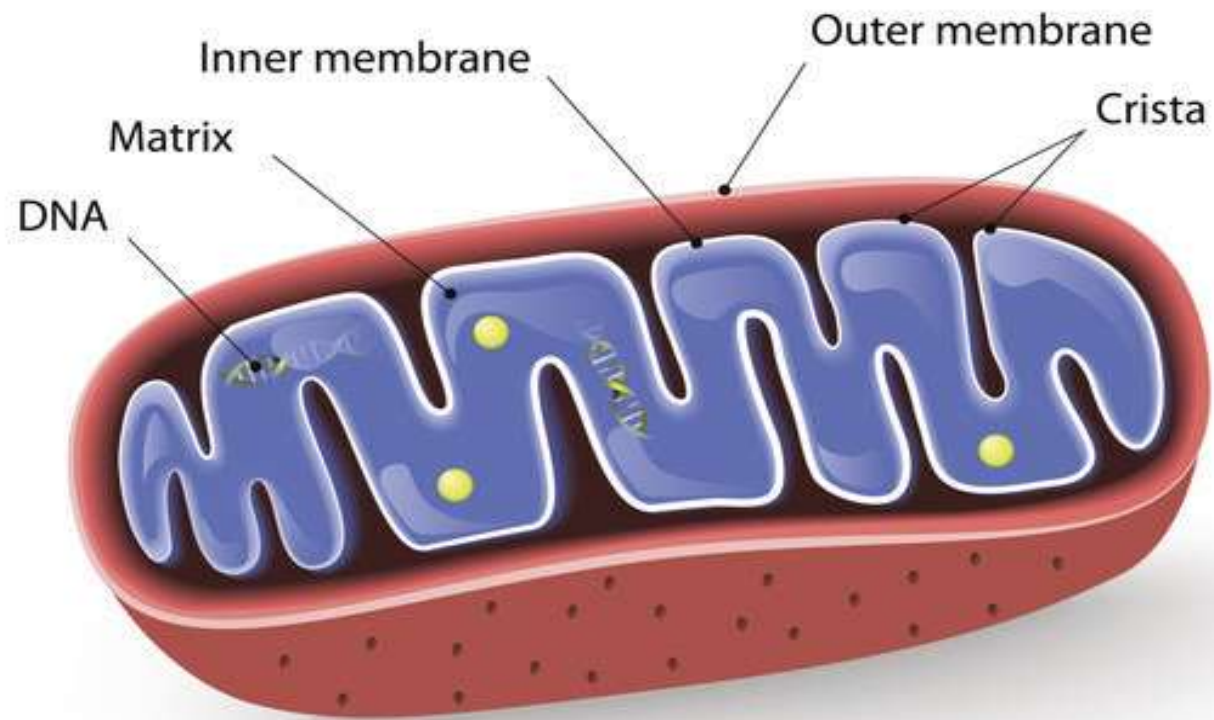
- Big organelle as circle or Oval shape. surrounded with by two membranes called **Nucleus membrane**. Act to regulation the materials pass from inter and outer of nucleus.
- Have chromosomes (DNA) and Basic Proteins called **Hitones** and have nucleoli and its important to a bear genetics informations.

Mitochondria

- Oval shape it surrounded by two membranes, outer membrane is very solid which is 50% lipid and 50% protein but inner membrane is thin which 20% lipid and 80% protein.
- Have more **cristae** and have much enzymes that act to ATP by Oxidative phosphorylation.
- Have important part called **Matrix** and proteins, lipids phospholipid and Nucleic acids (much RNA little DNA). And Enzymes for Krebs cycle.
- The main role of Mitochondria energy production therefore it's called **Power houses of the cell**. The cell that production to much proteins quantities this need large numbers mitochondria

MITOCHONDRIA

MITOCHONDRION



Microbody:

organelles rich of Catalase Enzymes and D-Amino acid oxidase and another oxidative enzymes. As Urate oxidase and produced H_2O_2 by Oxygen reducts then it dissociation to Water and Oxygen.

Golgi Bodies

Vesicles have channels the main role of this organelles as a place station in way to transfer the materials and as pool of to store proteins that produce from Endoplasmic reticulum to transfer out of cell.

Lysosomes

circle shape and contains many **Hydrolase Enzymes** in optima pH in acidic med. The neutrality of membrane of this bodies as a lipoproteins , when the cell is dead then this membrane is destroyed and made the enzyme hydrolyses to digestion the cell components.