



PRACTICAL HISTOLOGY 1 - FIRST COURSE

LAB -1- CELL STRUCTURE & FUNCTION

Sawa University

جامعة ساوة الاهلية

College of health and medical techniques

كلية التقنيات الصحية والطبية

Department of Medical Laboratories

قسم تقنيات المختبرات الطبية

First stage

المرحلة الاولى

محاضرة رقم 2

الجانب العملي

Lecture No. 2

Practical

تدريسي المادة : م.م هبه صاحب صادق

OUTLINES

- The concept of the cell as the basic unit of life: Understand why the cell is the simplest unit that carries the characteristics of life.
- The structure and functions of major organelles: Explore the role of:
- The nucleus (central organelle).

Aims of lecture :-

1-DEFINE THE CELL

2-DESCRIBE THE MAIN COMPONENTS OF A TYPICAL CELL

3-IDENTIFY AND EXPLAIN THE FUNCTION OF KEY
ORGANELLES

4-DIFFERENTIATE BETWEEN EUKARYOTIC AND PROKARYOTIC
CELLS

Cell Theory

All living things are made up of cells. Cells are the smallest units of life in living things. All cells arise from pre-existing cells through cell division.

Definition of Cell

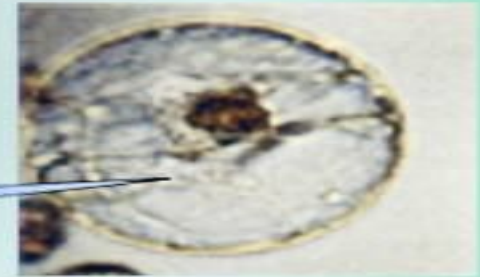
The smallest independent living unit that makes up all living organisms and body tissues. A cell consists of three main parts: the cell membrane, the nucleus, and the cytoplasm.

Examples of Cells

Examples of Cells



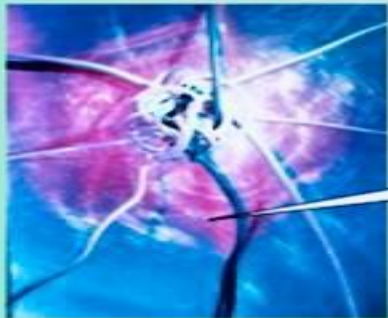
Amoeba Proteus



Plant Stem



Bacteria



Nerve Cell



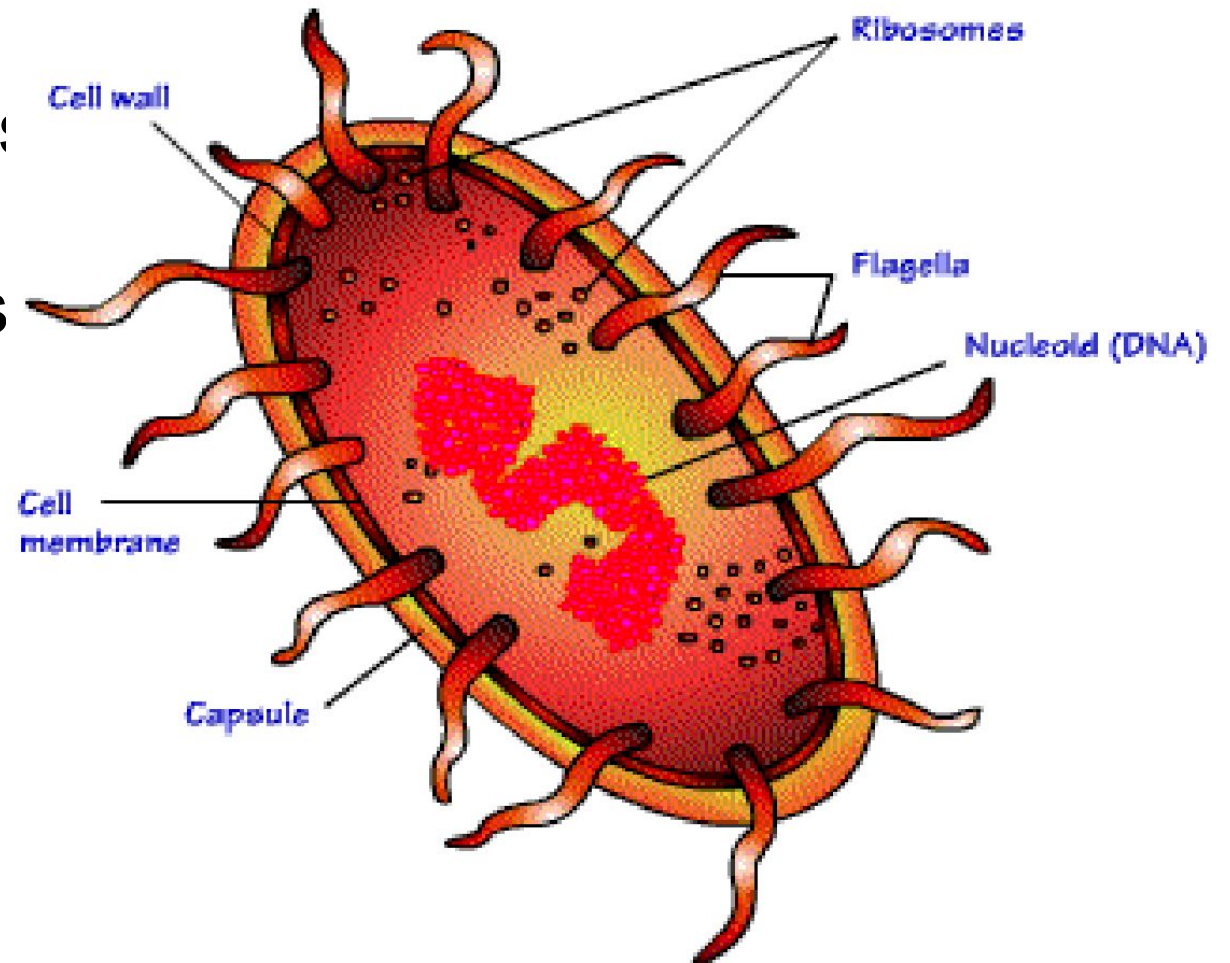
Red Blood Cell

Types of Cells

- ☐ • Prokaryotic
- ☐ • Eukaryotic

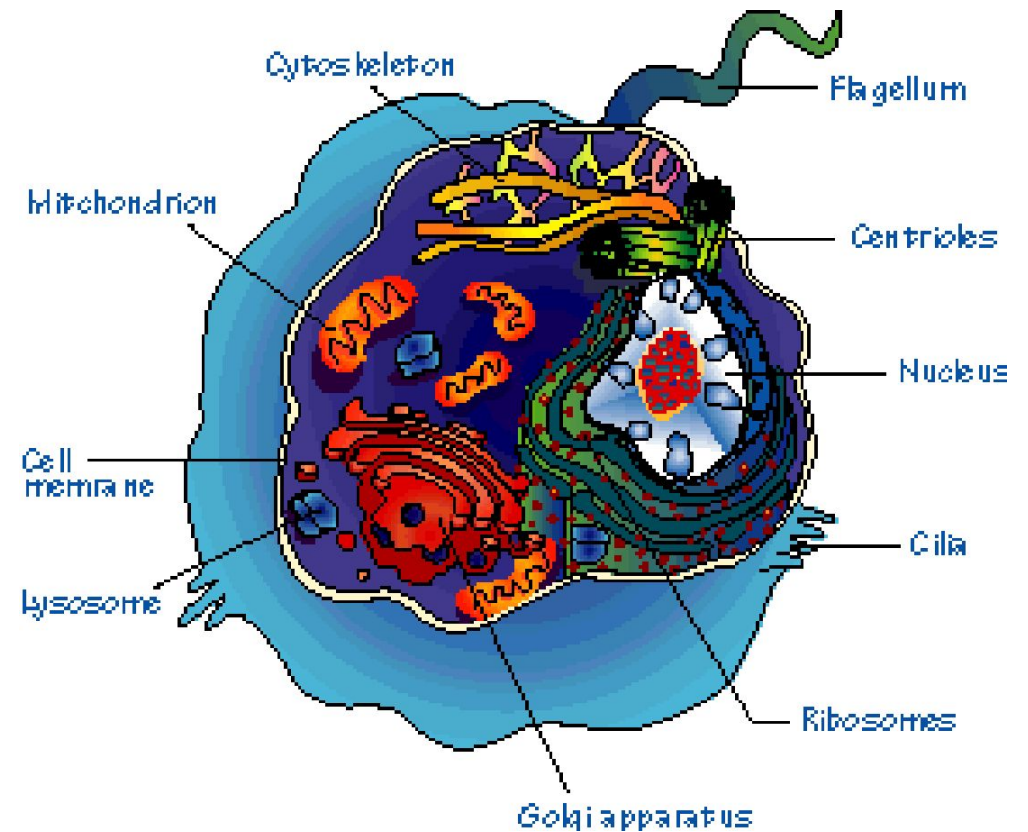
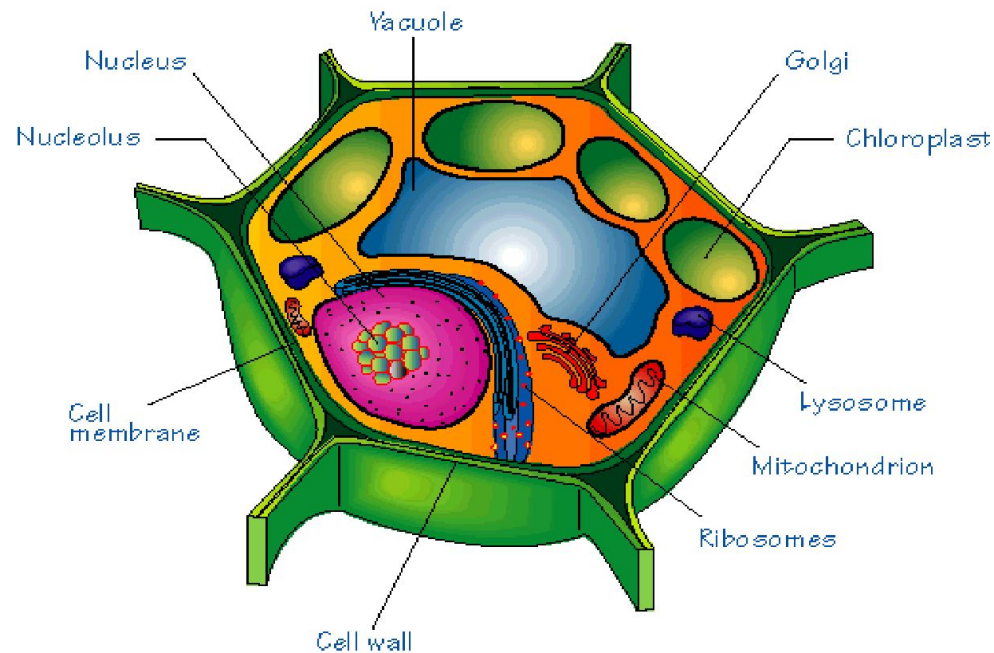
Prokaryotic

- Do not have structure: surrounded by membranes
- Few internal structures
- One-celled organisms, Bacteria

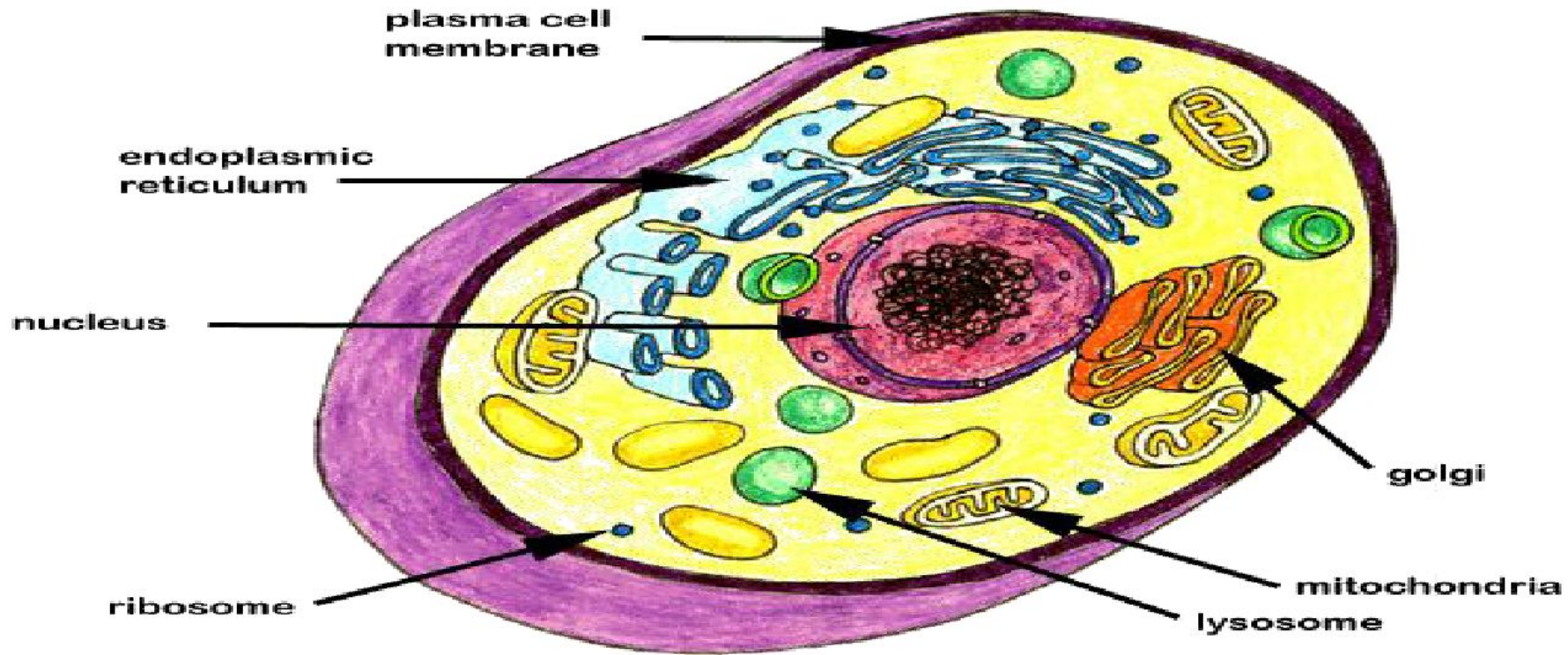


Eukaryotic

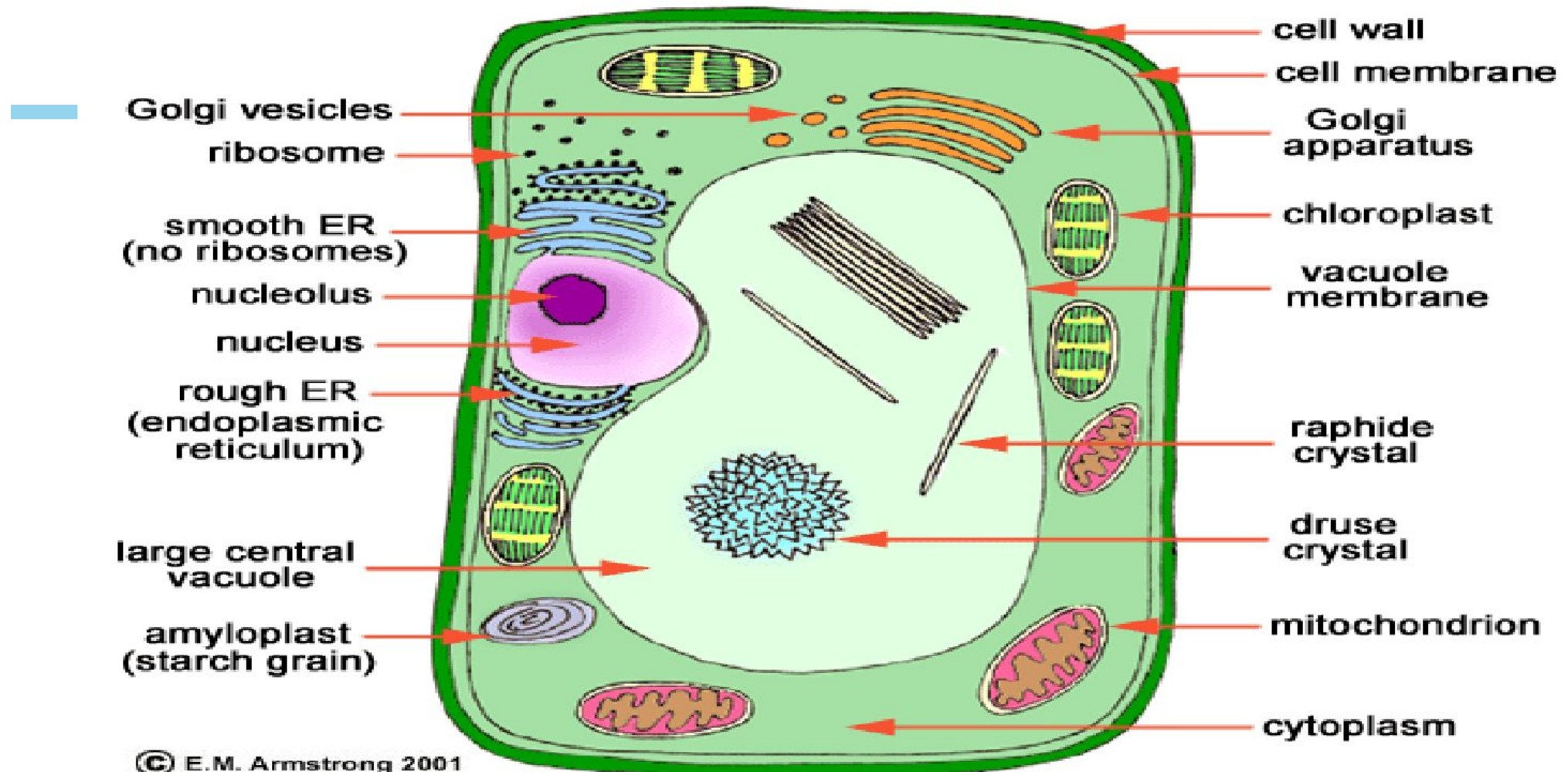
- •Contain organelles surrounded by membranes
- •Most living organisms



“Typical” Animal Cell



“Typical” Plant Cell



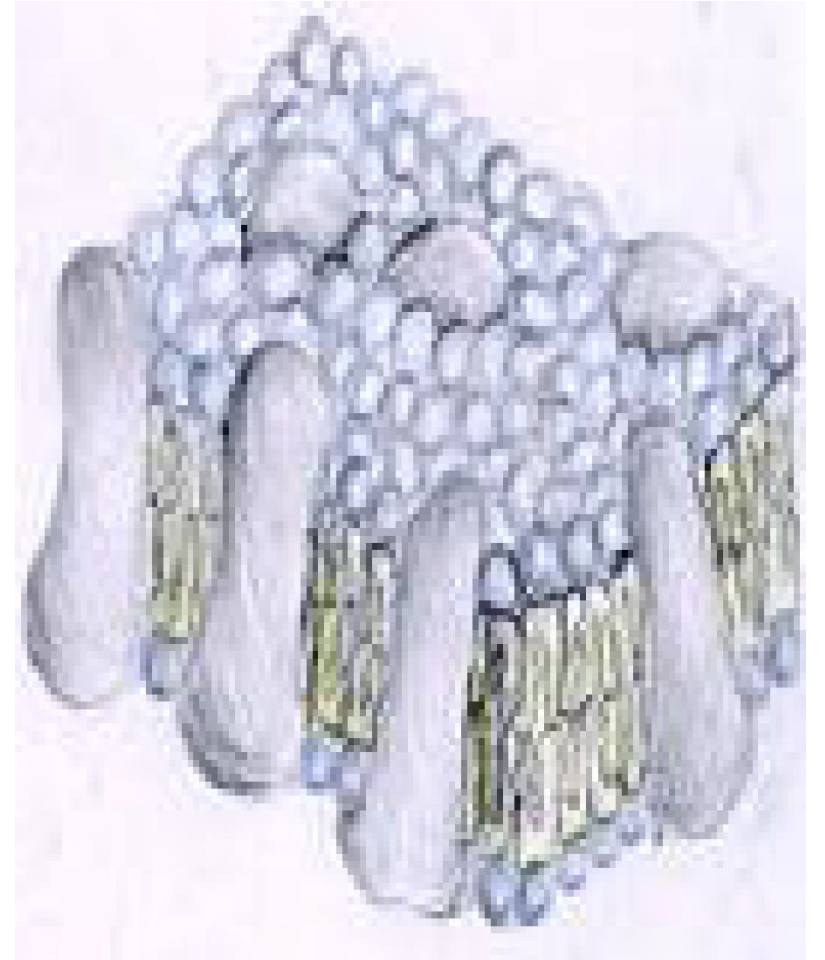
Cell Parts

Organelles

Surrounding the Cell

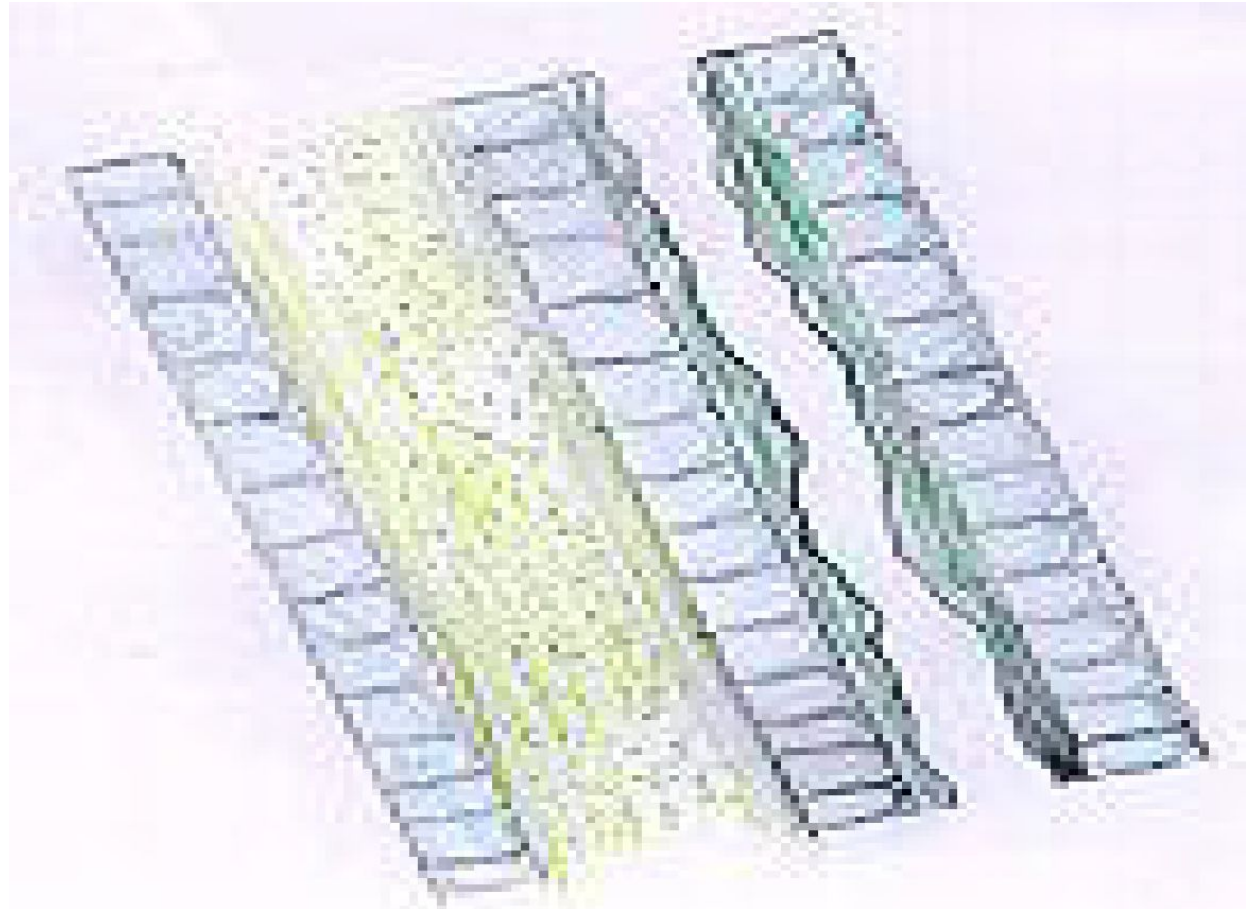
Cell Membrane

- The cell membrane is a double layer of phospholipid molecules. The proteins within it provide structural support, form channels for the passage of substances, and act as receptors. The cell membrane separates substances outside the cell (extracellular) from substances inside it (intracellular). The cell membrane maintains the integrity of its surface and controls the passage of substances into and out of the cell.



Cell Wall

- Most commonly found in plant cells & bacteria
- Supports & protects cells



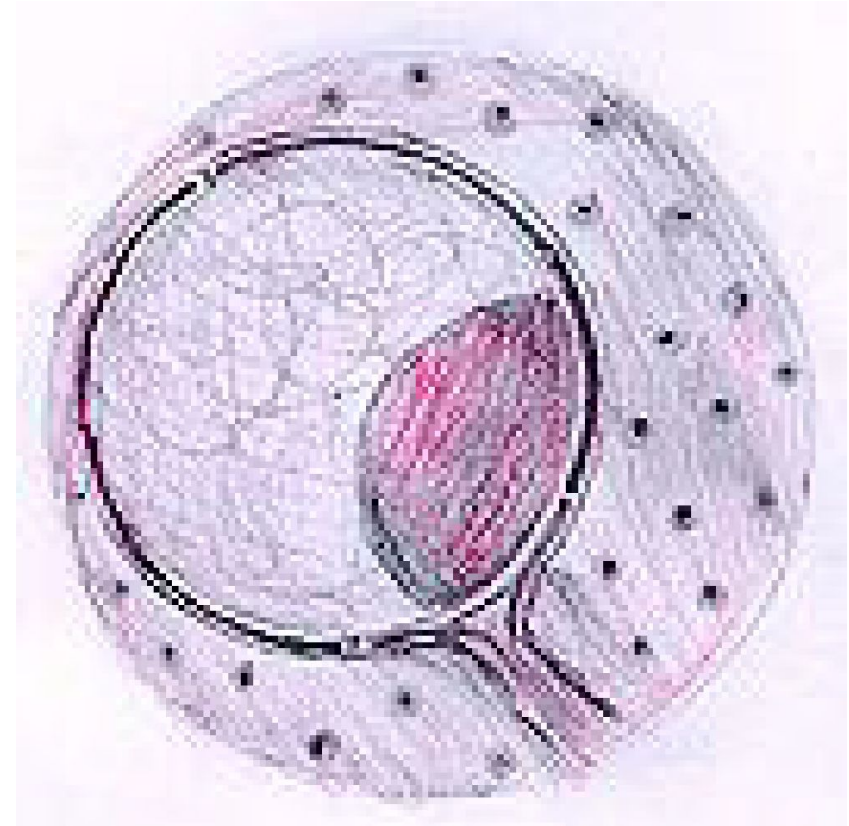
Inside the Cell

Nucleus

- Directs cell activities
- Separated from cytoplasm by nuclear membrane
- Contains genetic material -DNA

Nuclear Membrane

- Surrounds nucleus
- Made of two layers
- Openings allow material to enter and leave nucleus

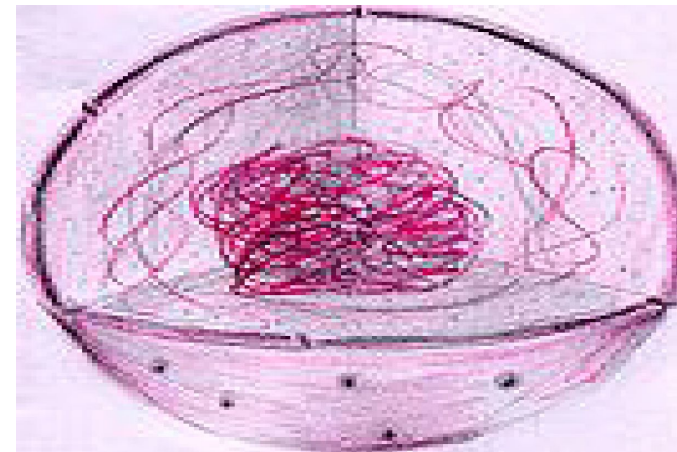
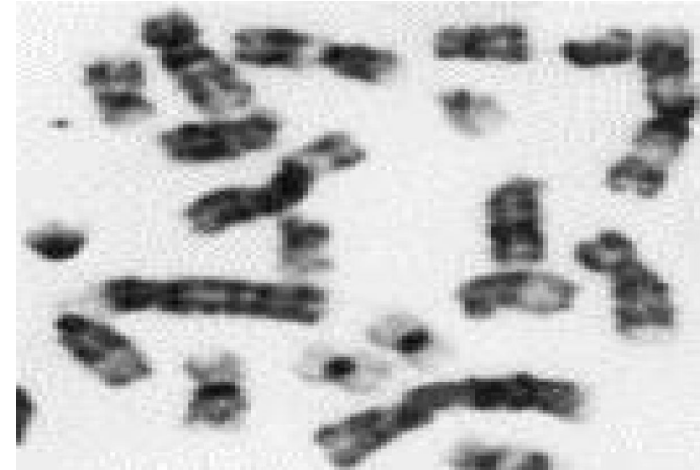


Chromosomes

- In nucleus
- Made of DNA
- Contain instructions for traits & characteristics

Nucleolus

- Inside nucleus
- Contains RNA to build proteins



Cytoplasm

- •The cytoplasm is the gel-like fluid inside the cell.
- It is the medium for chemical reaction. All of the functions for cell expansion, growth and replication are carried out in the cytoplasm of a cell.
- Within the cytoplasm, materials move by diffusion.

Cytoplasmic organelles

- Cytoplasmic organelles are "little organs" that are suspended in the cytoplasm of the cell.
- Each type of organelle has a definite structure and a specific role in the function of the cell.
- Examples of cytoplasmic organelles are mitochondrion, ribosomes, endoplasmic reticulum, Golgi apparatus, and lysosomes

Endoplasmic Reticulum

- Moves materials around in cell
- Smooth type: lacks ribosomes
- Rough type (pictured): ribosomes embedded in surface



Ribosomes

- A structure found within cells that is involved in making proteins.
- Ribosomes help link amino acids together to form proteins.



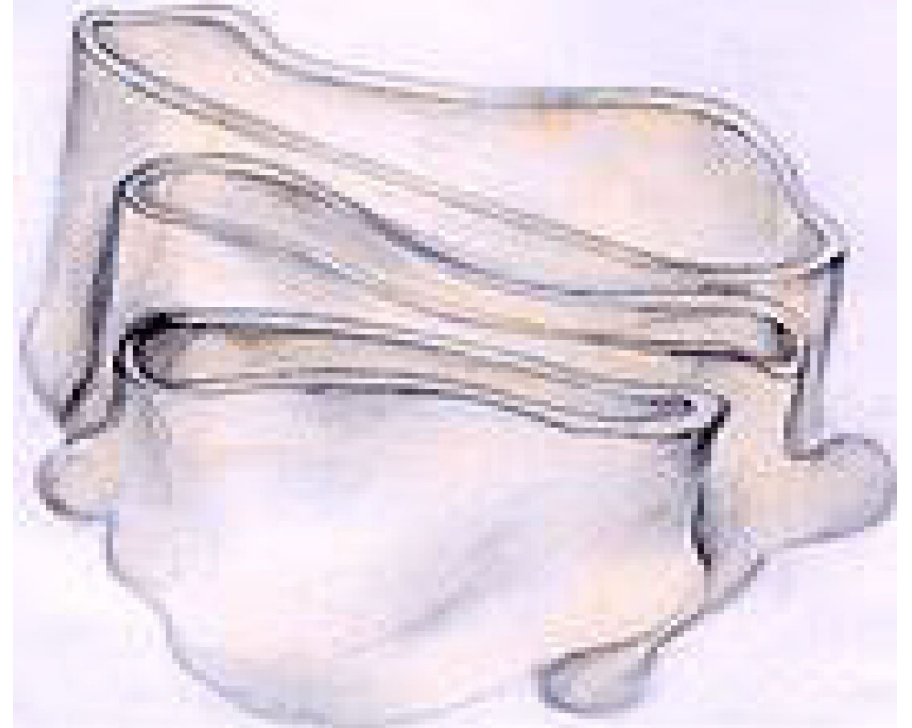
Mitochondria

- Produces energy through chemical reactions –breaking down fats & carbohydrates
- Controls level of water and other materialism cell
- Recycles and decomposes proteins, fats, and carbohydrates



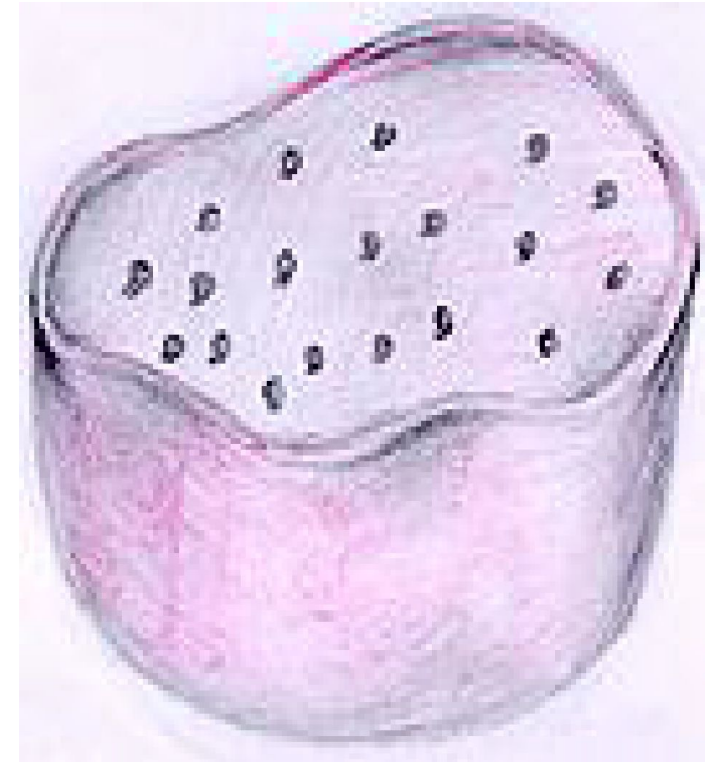
Golgi apparatus

- A group of small, flat, membrane-bound sacs within the cell's cytoplasm (a jelly-like fluid).
- The Golgi apparatus prepares proteins and lipid molecules for use elsewhere inside and outside the cell.



Lysosome

- A sac-like compartment inside a cell that has enzymes
- Digestive for proteins, fats, and carbohydrates
- Transports undigested material to cell membrane for removal
- Cell breaks down if lysosome explodes

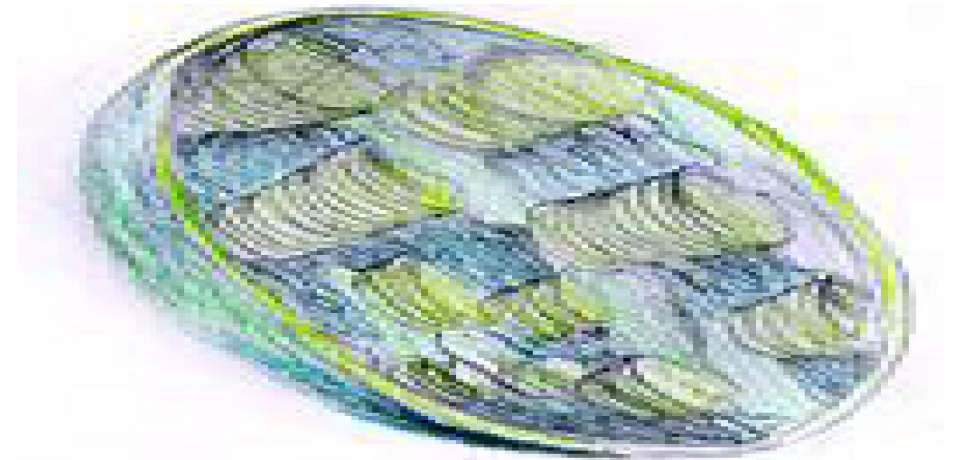


Vacuoles

- Membrane-bound sacs for storage, digestion, and waste removal
- Contains water solution
- Help plants maintain shape

Chloroplast

- Usually found in plant cells
- Contains green chlorophyll
- Where photosynthesis takes place



Discussion :-

- 1-What are the different Prokaryotic and Eukaryotic?
- 2- define Endoplasmic reticulum and Golgi apparatus ?

References

- Pathologic basis of diseases, A57 edition, 2012.
- <http://waynesword.palomar.edu/images/plant3.gif>.

Any questions?

*Thank
You*