



HISTOPATHOLOGY - FIRST COURSE

LAB -1- INTRODUCTION TO PATHOLOGY

Sawa University

جامعة ساوة الاهلية

College of health and medical techniques

كلية التقنيات الصحية والطبية

Department of Medical Laboratories

قسم تقنيات المختبرات الطبية

Third Stage

المرحلة الثالثة

محاضرة رقم 1

Lecture No. 1

الجانب العملي

Practical

تدريسيين المادة : م.م هبه صاحب صادق
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The main goals of pathology are:

1. Diagnosing diseases.

2. Diagnosis of diseases through the study of structural and functional changes occurring in cells, tissues, and organs. This helps in understanding the causes of diseases, how they develop, and their effects on the body through microscopic and ocular analysis, and is essential for determining treatment and follow-up plans.

INTRODUCTION:

Pathology: is the scientific study of the causes and effects of disease by scientific methods for treating the essential nature of it.

Pathology as defined in this way embraces a number of scientific specialties including:

1. Histology & Cytology in which the structural changes in diseased tissue are examined by naked eye examination or by light & electron microscopy of tissue sections or smears.

2. Clinical Chemistry in which the metabolic of disease are investigated by assay of various normal & abnormal compounds in the blood, urine, etc.

3. Microbiology in which body fluids, mucosal surfaces, excised tissues, etc. are examined by microscopical, cultural & serological techniques to detect & identify the micro-organisms responsible for many diseases.

4. Haematology investigation of abnormalities of the cells of the blood & their precursors in haemopoietic tissue & of the haemostatic, including the clotting, mechanism.

5. **Clinical Genetics**, in which inherited chromosomal abnormalities in the germ cell or acquired chromosomal abnormalities in somatic cells are investigated using the techniques of molecular biology.

6. These divisions of pathology have resulted from increasing specialization in techniques & from expanding knowledge within each discipline.

7. Disease is an abnormal variation in the structure or function of any part of the body.

e.g. :

a. Epilepsy cause defect in the function.

b. Necrosis & inflammation cause abnormal structure in the disease.

c. Pneumonia: inflammation of the lung.(there are structural changes in the lung & disturbance of the function of respiration).

Pathology deals with the causes, effects, pathogenesis, planning for treatment & diagnosis, and prevention of diseases.

1. **Etiology**: means the cause of disease. (e.g.):

- a. Bacterial infection of the lung causes pneumonia.
- b. cut of blood supply by coronary artery causes infarction of the heart

2. **Pathogenesis**: means the mechanism of development disease. (e.g.):

- In viral infection: the virus proliferates inside the cell leading to a lesion or disease.
- While bacteria release toxin which destroy the cells.

3. Treatment :

- ❖ The pathologist helps in treatment of the disease by giving information to the surgeon or physician or dermatologist about the lesion whether it is benign or malignant & activities of tumor.
- ❖ Surgeon sometimes asks the pathologist about the type of tumor, so they can choose the correct treatment, also help in planning of the prognosis of the disease.

4. **Prognosis:** means the outcome of the disease, is it curable or is it fatal?

5. **Prevention:** when you know the causes & the pathogenesis you can plan for prevention of the disease by isolation or vaccination.

Histopathology: is a branch of pathology which deals with the study of disease in a tissue section.

The tissue undergoes a series of steps before it reaches the examiners desk to be thoroughly examined microscopically to arrive at a particular diagnosis.

- To achieve this it is important that the tissue must be prepared in such a manner that it is sufficiently thick or thin to be examined microscopically and all the structures in a tissue may be differentiated.
- The term **histochemistry** means study of chemical nature of the tissue components by histological methods.
- **Tissue** is a group of cells specialized and differentiated to perform a specialized function. Collection of different type of cells forms an organ.

Why we learn pathology?

Why we learn pathology?

Because it help in:

1. Interpretation of signs & symptoms of diseases .
2. Understanding the biochemical changes.
3. Interpretation of imagine techniques e.g. x-ray or u/s.
4. Diagnosis, treatment, prognosis & prevention of disease.

Types of diseases:

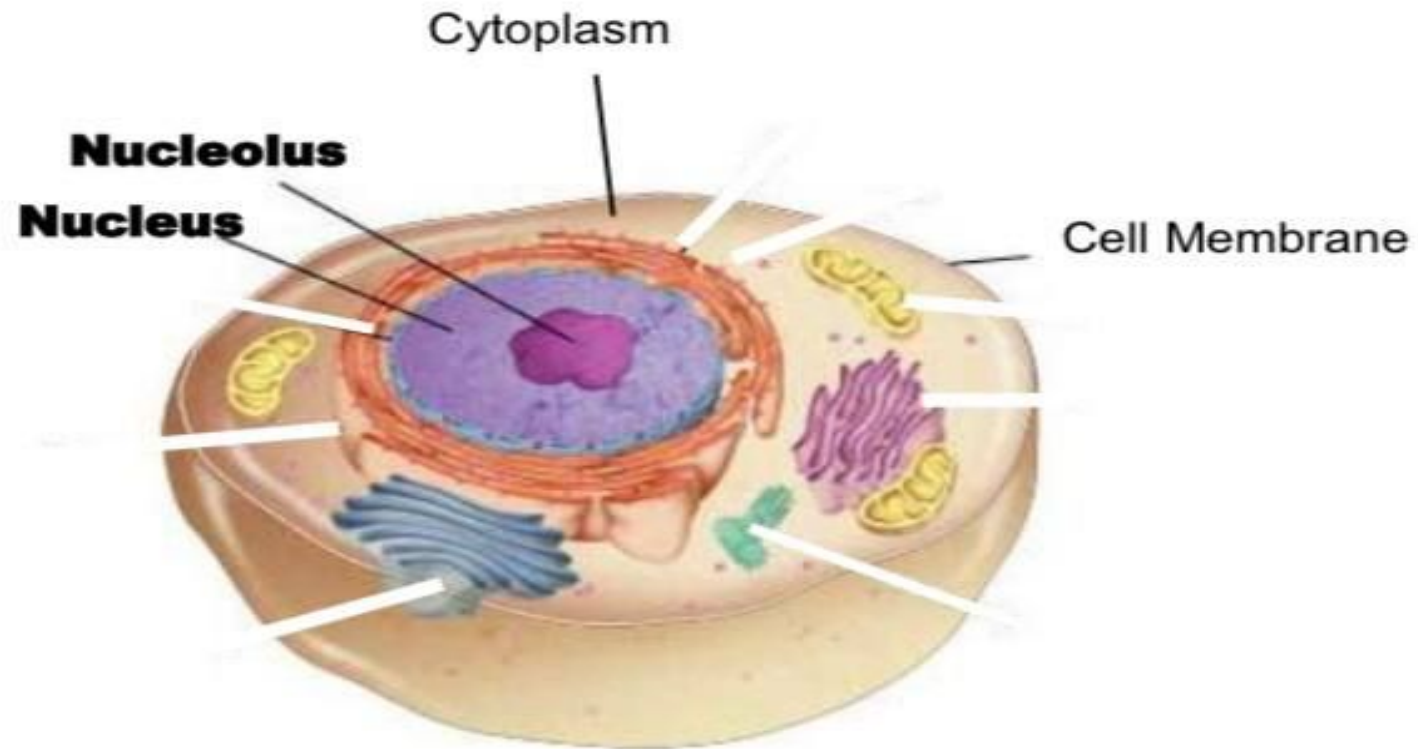
1. **Congenital**: mean develop during intrauterine life.(e.g. congenital heart diseases)
2. **Postnatal**: mean after birth.(e.g. all infections, tumors, etc.).

Cell Organelles and Structures

What is a Cell

- ❖ Identify and describe the function of the major Human and animal cell organelles.
- ❖ Cells are the structural and functional units of all living organisms . Some organisms, such as bacteria, are unicellular , consisting of a single cell. Other organisms, such as humans, are multicellular.
- ❖ Organelles a specialized subunit of a cell that has a specific function

Animal Cell



Cell Organelles and Function

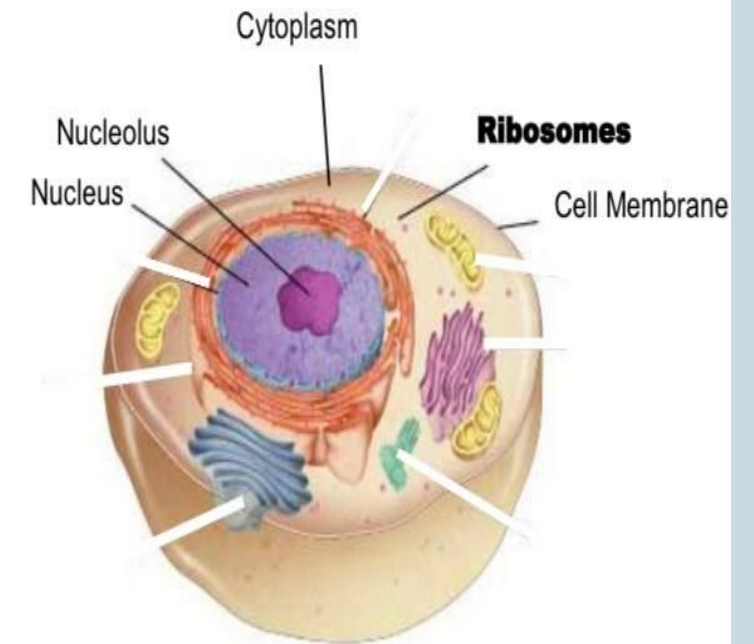
1. Nucleus

- ❖ **Function:** holds the DNA
- ❖ **Part Nucleolus:** dark spot in the middle of the nucleus that helps make ribosomes

2. Cytoplasm

- ❖ **Function:** Where the organelles float around.

Animal Cell

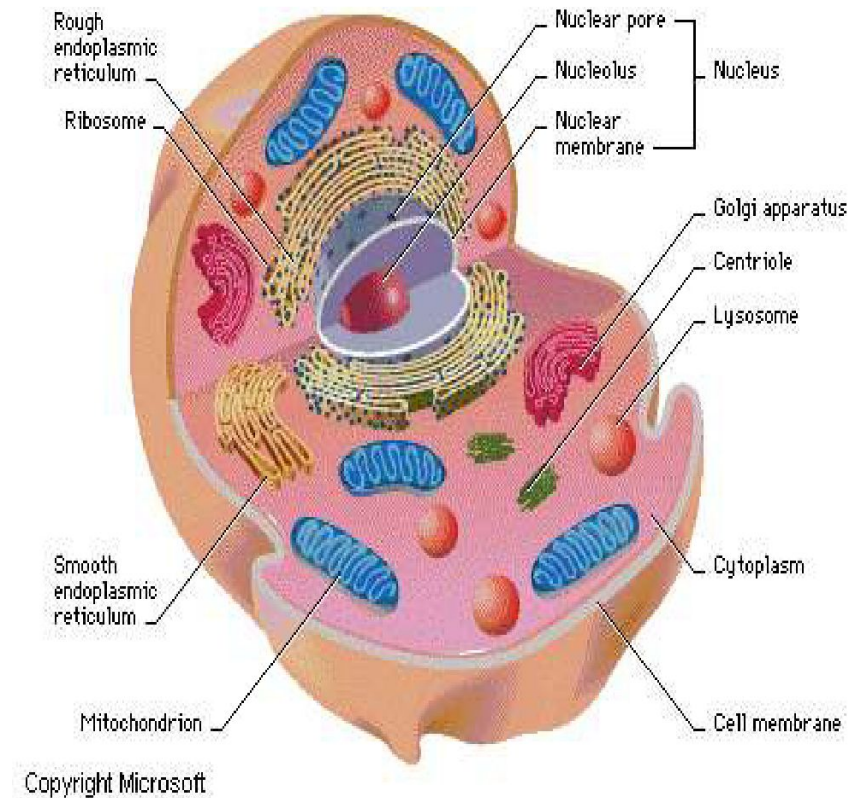


3. Ribosomes

- ❖ **Function:** makes proteins
- ❖ Found in all cells, prokaryotic and eukaryotic

4. Cell membrane

- ❖ **Function:** Structure support, Semi permeable membrane ,controls what goes into and comes out of the cell.



5. Endoplasmic Reticulum

- ❖ **Function:** Support framework of cell

- ❖ **Types:**

1. Rough ER:

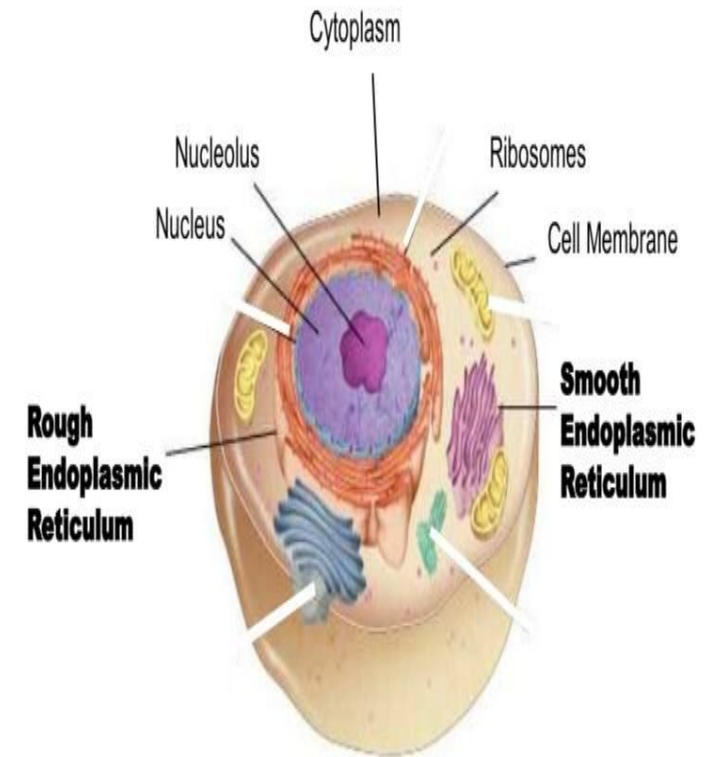
- ❖ **Description:** Rough appearance because it has Ribosomes

- ❖ **Function:** helps make proteins, that s why it has ribosomes

2. Smooth ER:

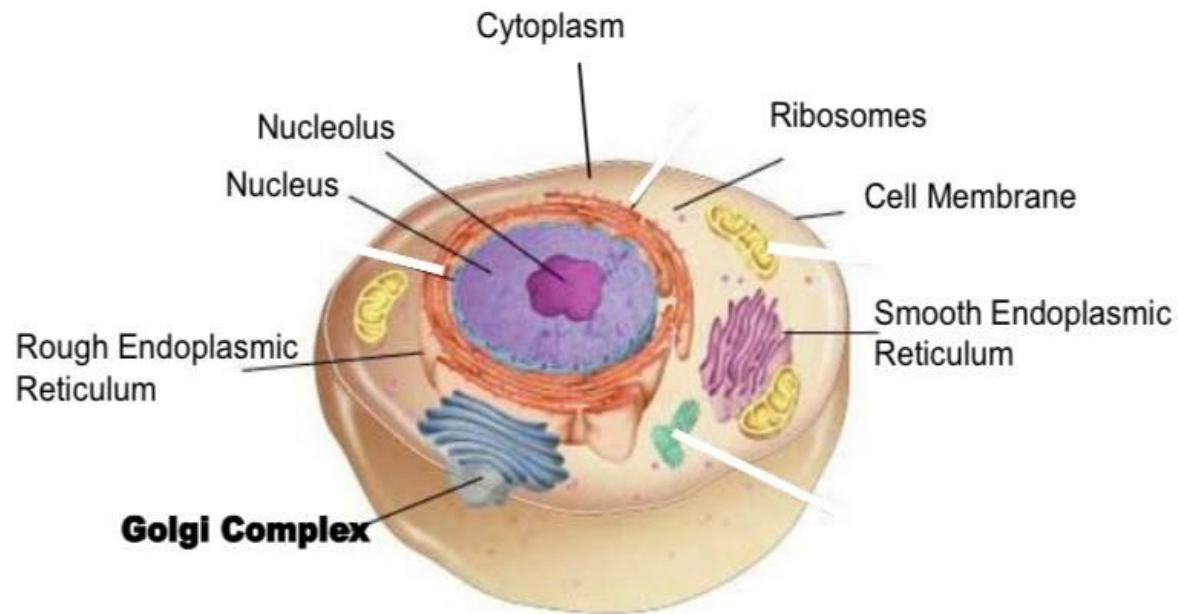
- ❖ **Description :** NO ribosomes

- ❖ **Function :** makes fats or lipids



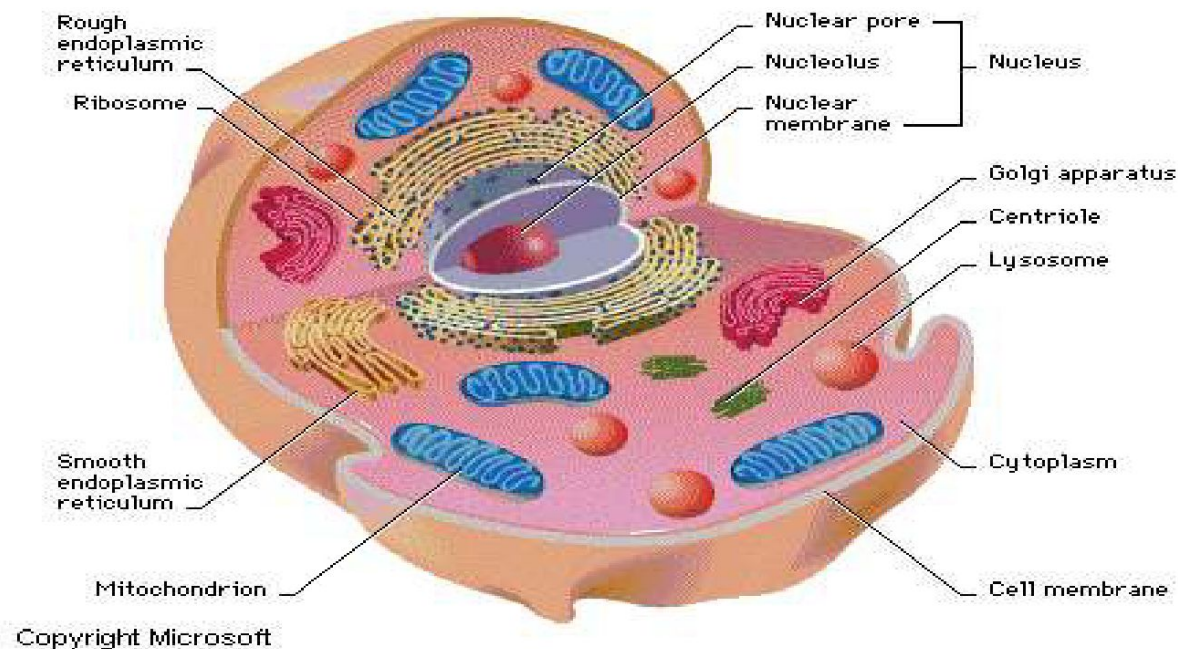
6. Golgi Complex, Golgi Bodies, Golgi Apparatus

Function: packages, modifies, and transports materials to different location inside/outside of the cell.



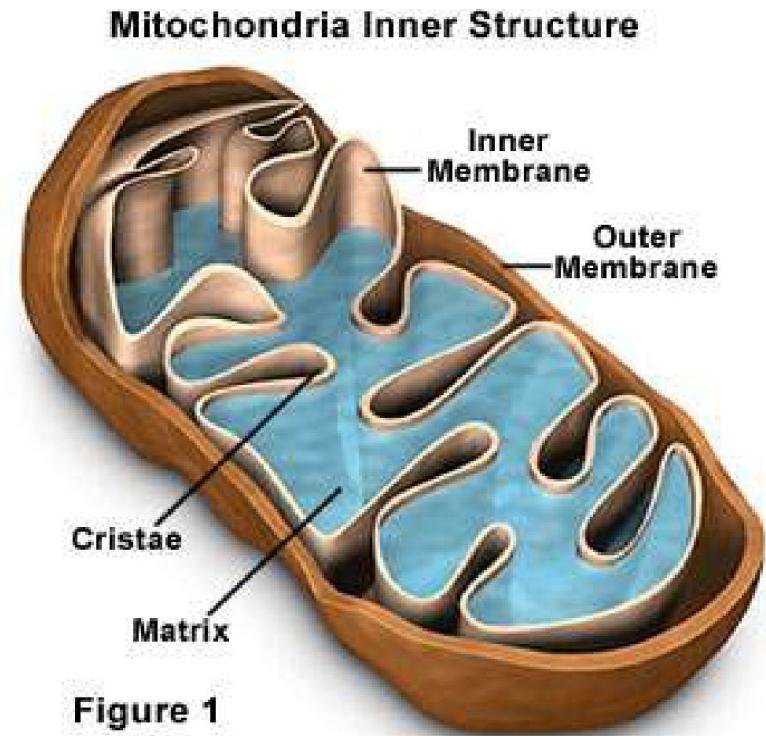
7 . Lysosomes

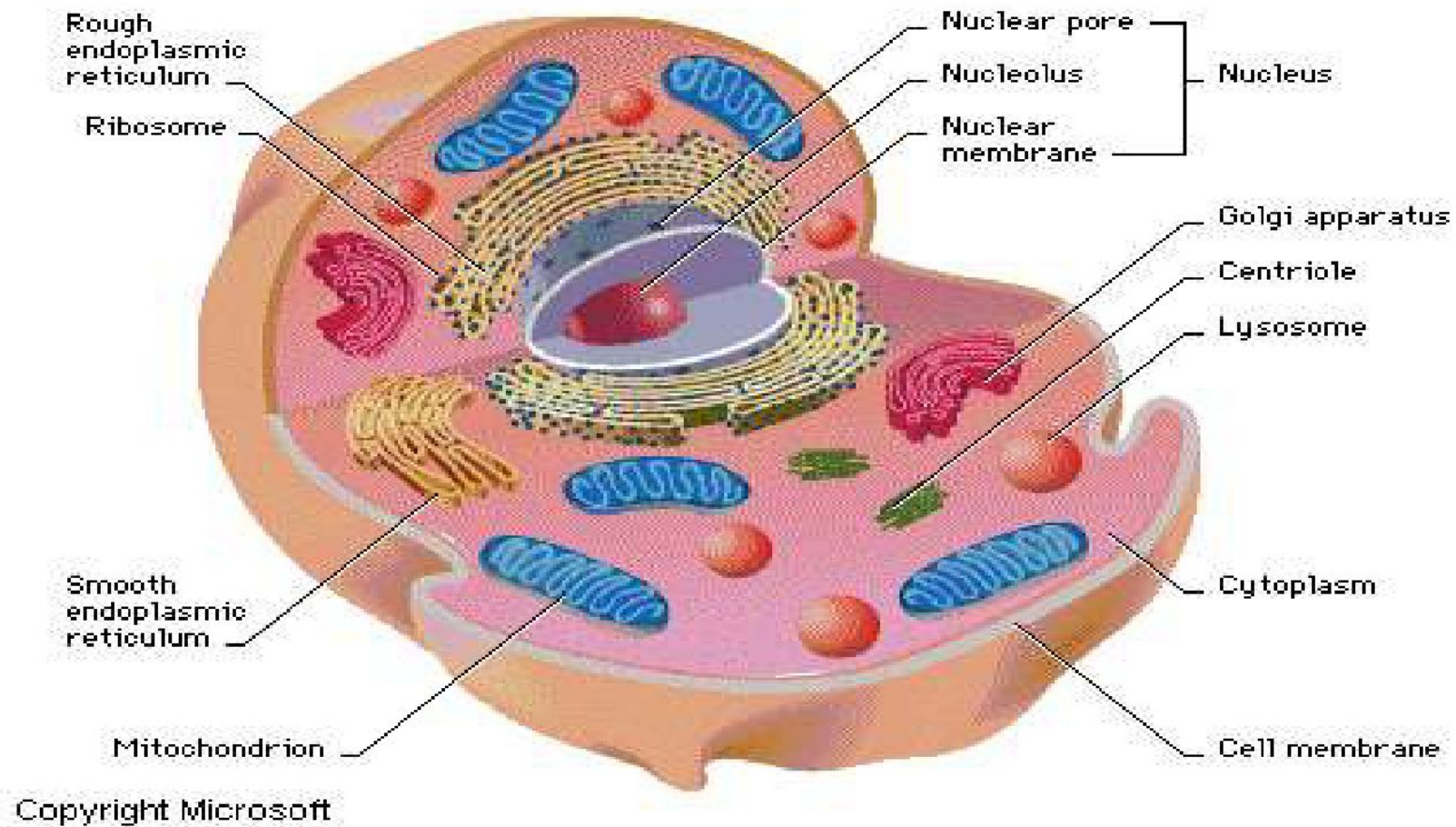
- ❖ **Function :** Contain digestive chemicals that help break down food molecules, cell wastes, and worn out cell parts (cells also).



8. Mitochondria

- ❖ **Function:** Energy formation, Breaks down food to make ATP.
- ❖ **ATP :** is the major fuel for all cell activities that require energy.





Any questions?

*Thank
You*