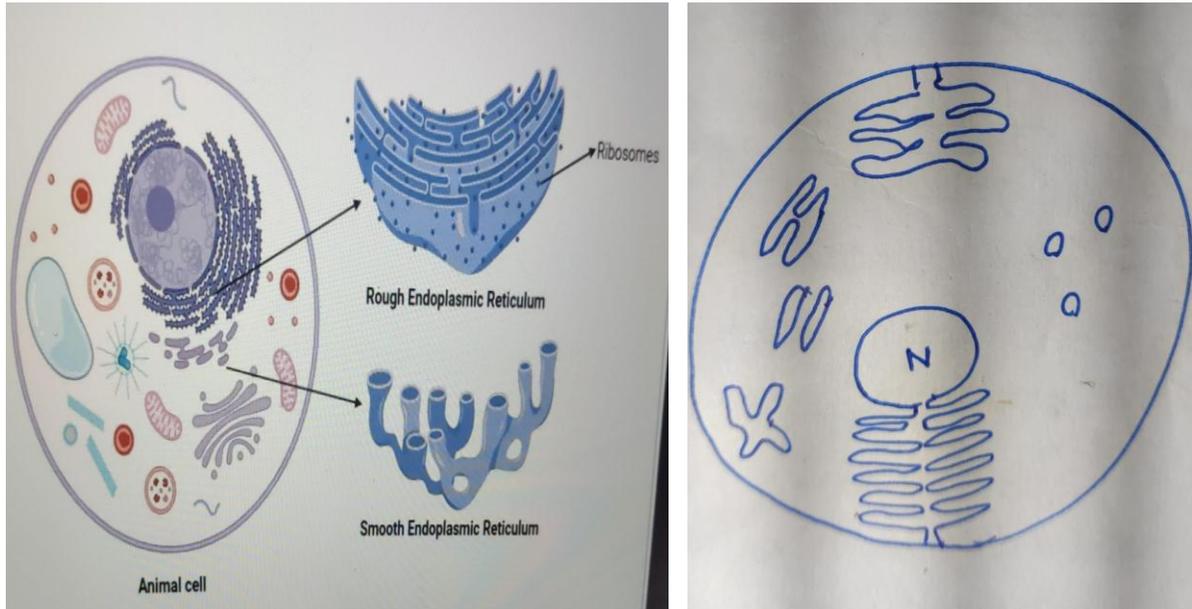


## ENDOPLAMIC RETICULUM

- Garnier called it as Ergastoplasm due to its basophilic nature.
- Original form of endoplasmic reticulum was discovered by Porter and name was also given by himself.



It forms network like structure throughout the cytoplasm.

ER is made up of 3 types of structure.

1. Vesicles
2. Tubules
3. Cisternae



Vesicles are spherical structure.

Tubules are tubular structure. It may be branched/unbranched.

Cisternae are small flattened sac like structures which are interconnected.

- Endoplasmic reticulum is present in eukaryotic cells but absent in RBCs, ovum and early embryonic cells.
- In some cells, these are poorly developed.

e.g. spermatocytes: Here present in form of vesicles only.

Adipocytes: Here present in form of tubules only.

- THERE ARE BASICALLY TWO TYPES OF ENDOPLASMIC RETICULUM
  - 1. Smooth endoplasmic reticulum (ribosome absent)
  - 2. Rough endoplasmic reticulum (ribosome is present/attached to the surface)
- 
- Smooth endoplasmic reticulum (SER) is made up of vesicles and tubules.
- 
- Rough endoplasmic reticulum (RER) is mainly made up of cisternae and tubules. Cisternae are flattened structures.
- 
- They are connected with each other with plasma membrane, nuclear membrane and with Golgi complex.

PM (Plasma membrane)



SER (Smooth Endoplasmic Reticulum)



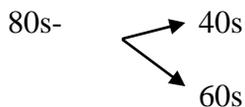
RER (Rough Endoplasmic Reticulum)



NM (Nuclear Membrane)

SER is present mainly in those cells where lipid synthesis (adipocytes) and glycogen metabolism takes place. They are also present in cortical part of adrenal gland.

Ribosomes are attached to endoplasmic reticulum with help of a glycoprotein called RIBOPHORIN.



With help of larger subunit i. e. 60s it is attached to endoplasmic reticulum.

Sometimes free ribosomes also get attached with surface of endoplasmic reticulum during protein synthesis with help of signal recognition particle (SRPs).

SRPs : ScRNA+Protein

To transport newly synthesized polypeptide to their target organ.

In protein synthesizing cells, RER is more in quantity.

In lipid and glycogen synthesizing cells, SER is more in quantity.

#### FUNCTIONS OF ENDOPLASMIC RETICULUM

1. Endoplasmic reticulum forms framework of cell.
2. It provides large surface area for various enzymatic activities.
3. Localization of cell organelle.
4. Conduction of impulses. It conducts the impulses from exterior to interior of the cell. It also plays role in conduction of impulse from one to other cell organelle.
5. It plays role in intracellular transport.
6. Storage is also their function as in SARCOPLASMIC RETICULUM. Sarcoplasmic reticulum stores calcium ions( $\text{Ca}^{++}$ ) in them and releases it during muscle contraction.
7. It plays role in detoxification of xenobiotics.

XENOBIOTICS: Foreign substance entering in the body.

e.g. cellular drug, carcinogen, pollutants etc.

For detoxification they contain Cyt P<sub>448</sub> and Cyt P<sub>450</sub>

Cyt P<sub>448</sub> is polycyclic aromatic hydrocarbon which detoxify by hydroxylation reaction.

Mainly cytochromes are present on SER of cells.

- **SPECIAL FUNCTIONS**

#### **SER**

1. Lipid synthesis
2. Glycogenolysis (glycogen metabolism)
3. Ascorbic acid synthesis with help of SER

4. Sphaerosomes are formed from SER.

## **RER**

1. Synthesis and transport of proteins