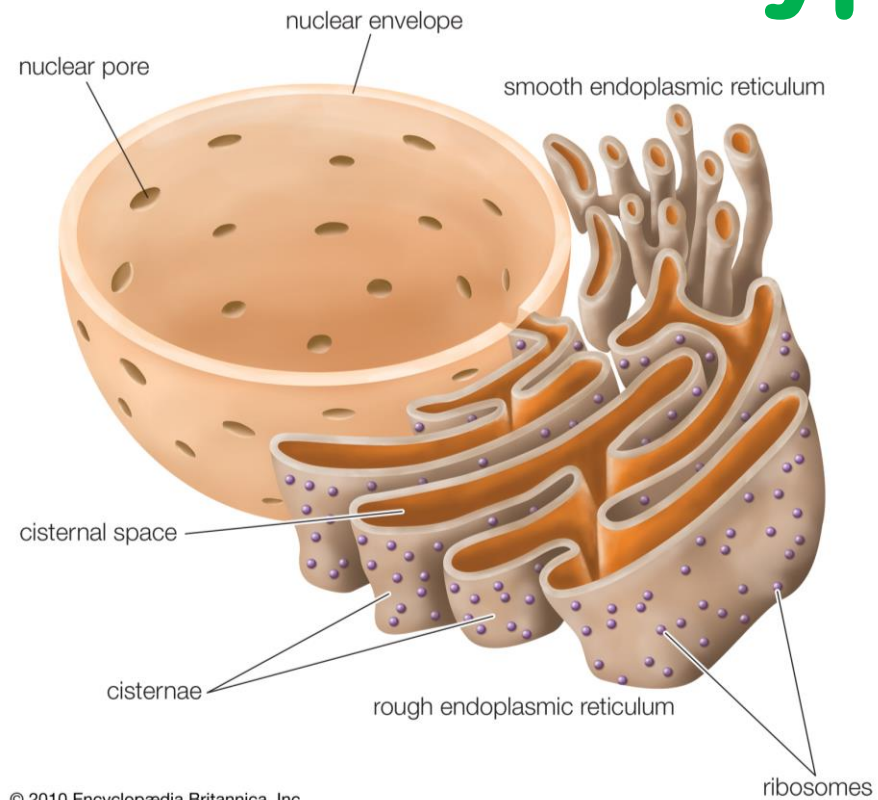
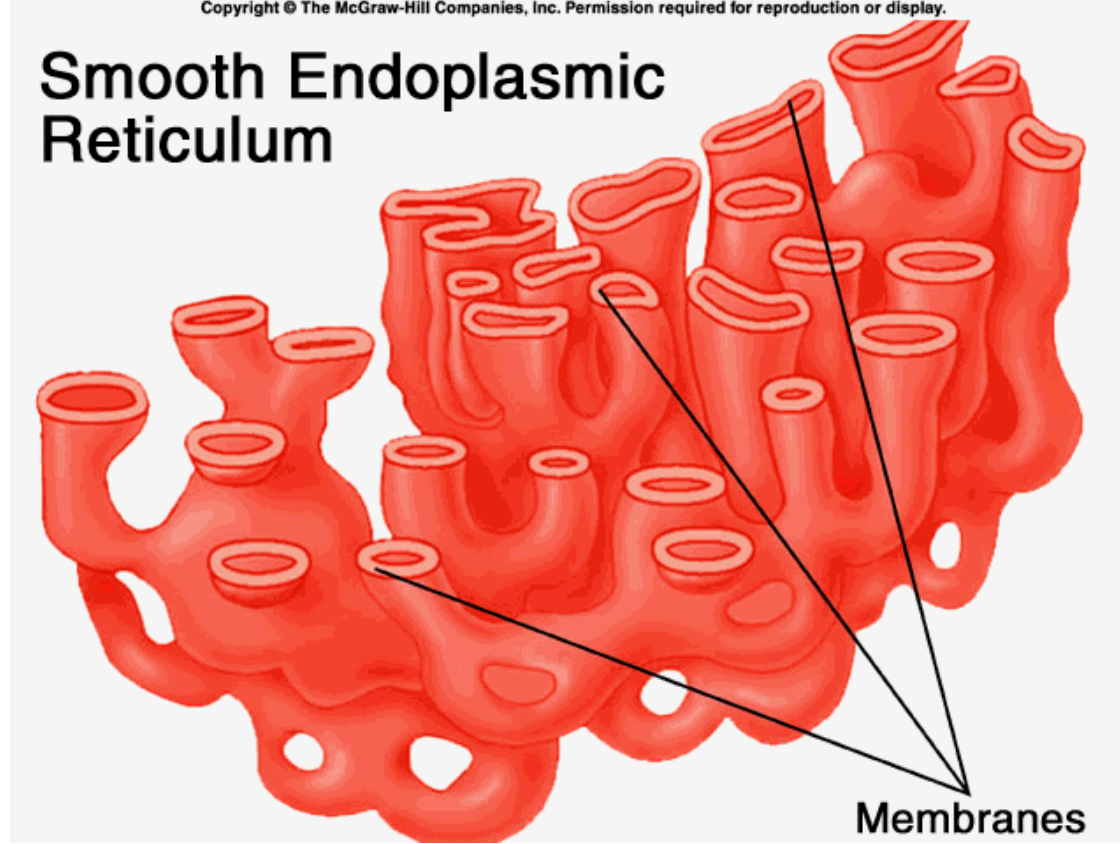


Endoplasmic Reticulum Types



Smooth Endoplasmic Reticulum



Dr. Rupesh B. Yadav

Asst. Prof.

TCSC, Mumbai.

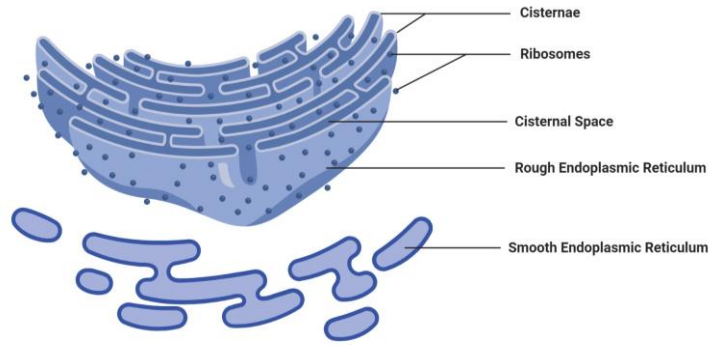
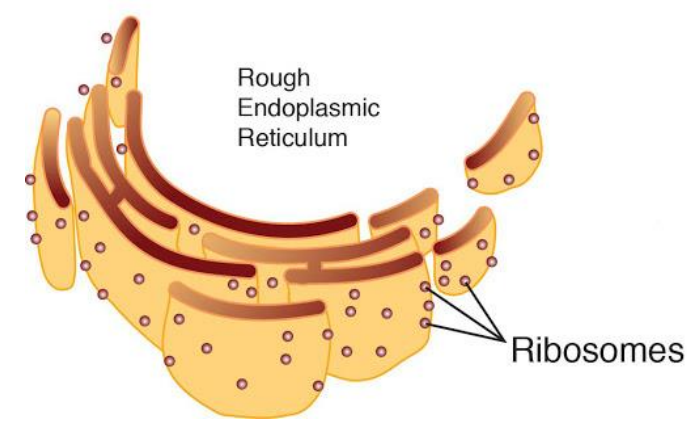


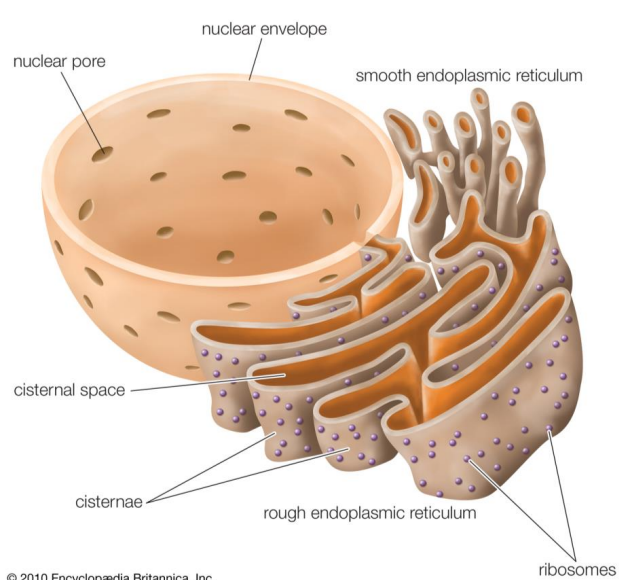
Figure: Endoplasmic Reticulum (ER), Image Copyright © Sagar Aryal, www.microbenotes.com

Endoplasmic reticulum

Types

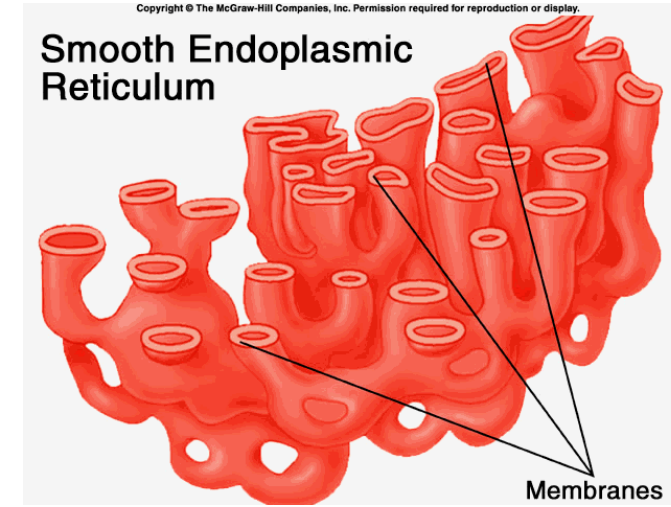


- The **structure** of endoplasmic reticulum is **shaped like a sac**. ER is of two types, each has its own distinguishing features:
- The endoplasmic reticulum (**ER**) is an **important organelle in eukaryotic cells**. It plays a **major role in the production, processing, and transport of proteins and lipids**.
- The **ER produces transmembrane proteins** and lipids for its membrane.



Endoplasmic reticulum

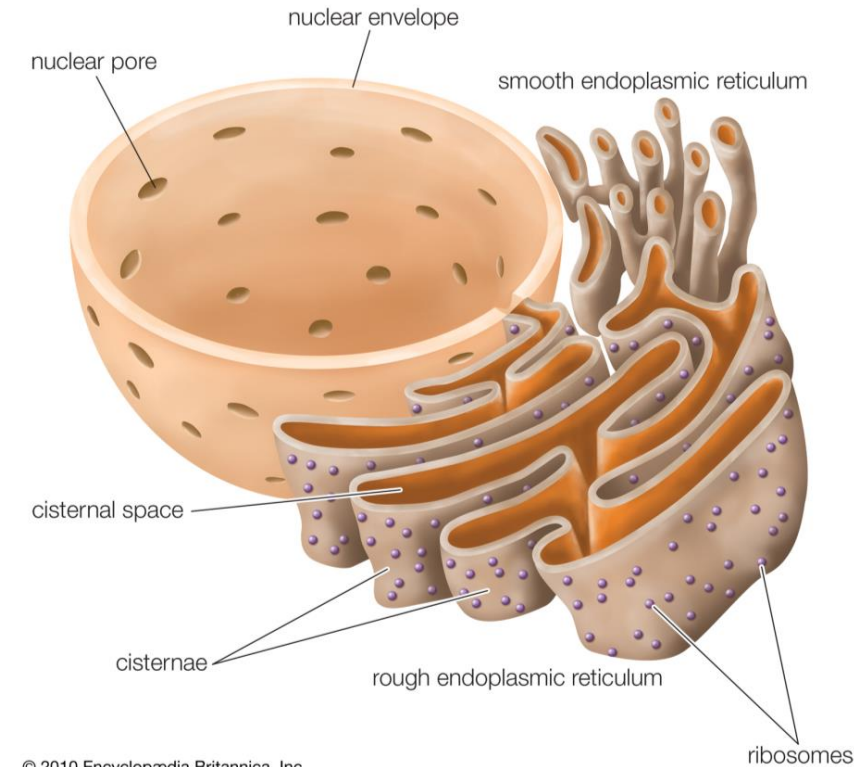
There are two different types of ER



- 1. **Rough endoplasmic reticulum (RER)** has **ribosomes embedded** within its structure, giving a **“rough”** appearance, its also called as **granular form of ER**.
- 2. **Smooth endoplasmic reticulum (SER)** does not have these ribosomes, hence **appear “smooth”**, it is also called as **agranular form of ER**

Rough Endoplasmic reticulum

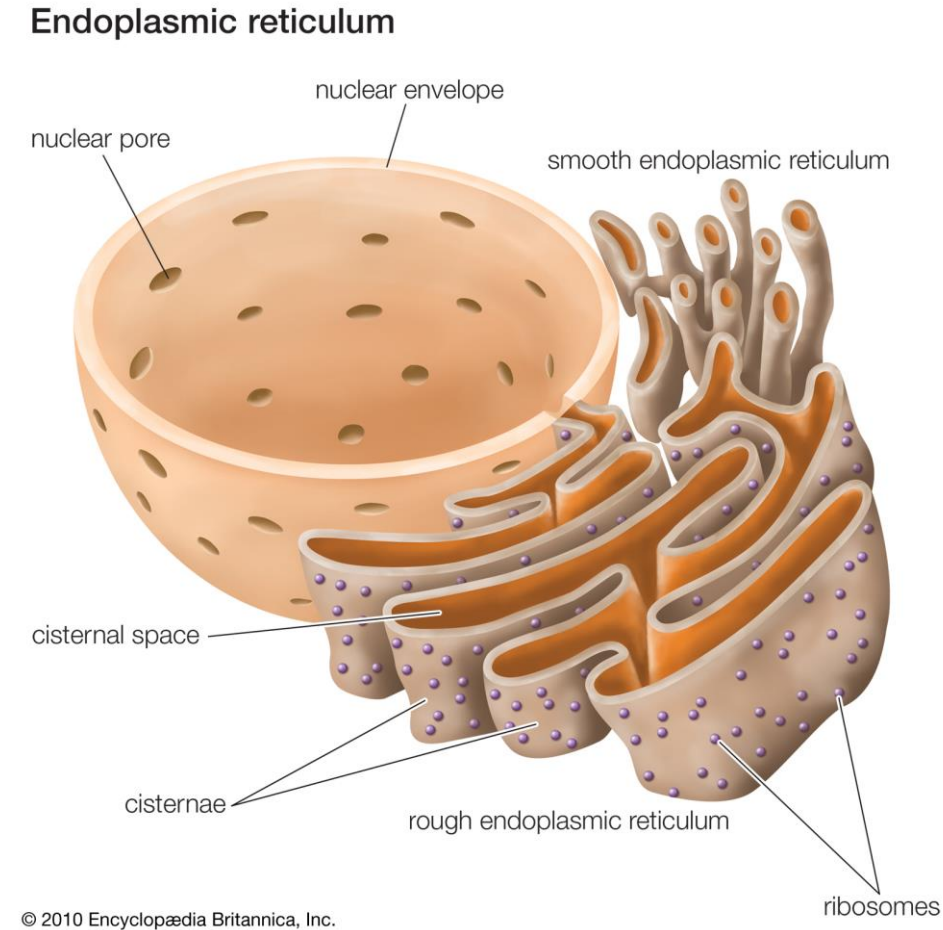
- **Flattish sealed sac** that is **continuous** with the **nuclear membrane**. **Made-up of Cisternae**
- The **rough endoplasmic** reticulum is named so because of **its appearance**.
- It is a series of connected fattened sacs having several **ribosomes on its outer surface**, hence the name.
- It synthesizes and **secretes proteins** in the liver, **hormones and other substances** in the glands.



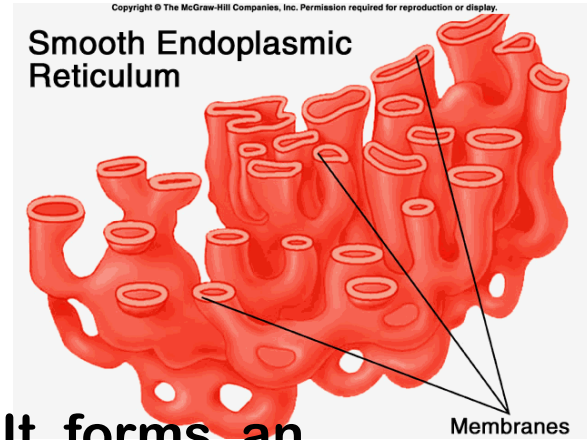
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Rough Endoplasmic reticulum

- RER is prominent in cells where protein synthesis happens.
- RER Commonly found in the cells like-
 - ✓ Fibroblast (Collagen & Elastin) cell
 - ✓ β -cell of Islets of Langerhans



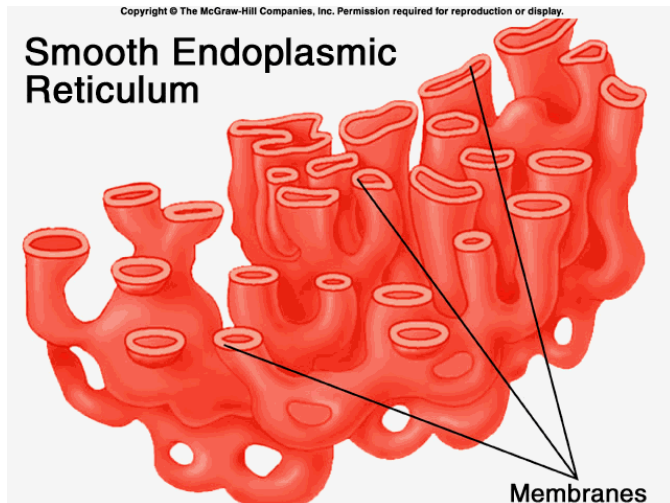
Smooth Endoplasmic reticulum



- It is **highly curved** and **made-up of tubules** & **close to PM**.
- **SER makes Desmotubules**, this is nothing but strands of ER, It forms an interconnecting system of pipelines which form a network throughout the cytoplasm (Makes the connection between two cell)
- It is **involved in the production of steroid hormones** in the adrenal cortex and endocrine glands.
- Lipid composition of the ER membrane is different to that of other cell compartments.
- It Has large abundance of phosphatidyl choline and a very low concentration of cholesterol.

Smooth Endoplasmic reticulum

- It **participates in the production of phospholipids**, the chief lipids in cell membranes and are essential in the process of metabolism.
- **SER transports the products of the RER** to other cellular organelles, especially the Golgi apparatus.



- SER also makes- **sarcoplasmic reticulum** which is present in muscle & plays an important role in Motor impulse in the muscle.
- **Sarcoplasmic reticulum** is also helped in removal of lactic acid (formed during anaerobic breakdown of glucose) from the muscle.

Smooth Endoplasmic reticulum

- **SER helps in removal of certain toxic** (Detoxification) substances. eg. Benzpyrene
- **SER helps in Glycogenolysis** (Break down of Glycogen) specially in liver cell.
- **SER Commonly found** in the cells like-
 - ✓ **Adipocytes** (Fat producing & storing cell)
 - ✓ **Liver cell**
 - ✓ **Leydig's cell** eg. Steroidal hormones
 - ✓ **Follicular cell** (ovary)

*Thank
You*

