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Endoplasmic Reticulum (ER)

Endoplasmic Reticulum (ER) is present as an interconnection of tubules that are connected to the nuclear membrane in eukaryotic cells.

There are two types of ER based on the presence or absence of ribosomes on them:

1. Rough ER (RER) with ribosomes attached on the cytosolic face of Endoplasmic Reticulum and thus is involved in protein synthesis
2. Smooth ER (SER)which lacks ribosomes and has a function during lipid synthesis.

Structure

- Endoplasmic Reticulum exists in three forms viz. cisternae, vesicles, and tubules.

- Cisternae are sac-like flattened, unbranched structures that remain stacked one on top of another.
- Vesicles are spherical structures that carry proteins throughout the cell.
- Tubules are tubular branched structures forming a connection between cisternae and vesicles.

Functions

i. ER contains many of the enzymes required for several metabolic processes, and the surface of the ER is essential for other operations like diffusion, osmosis, and active transport.

ii. One of the crucial functions of ER is the synthesis of lipids like cholesterol and steroids.

- Rough ER allows for the modification of polypeptides emerging out of the ribosomes to prepare secondary and tertiary structures of the protein.
- ER also synthesizes various membrane proteins and has a crucial role in preparing the nuclear envelope after cell division.