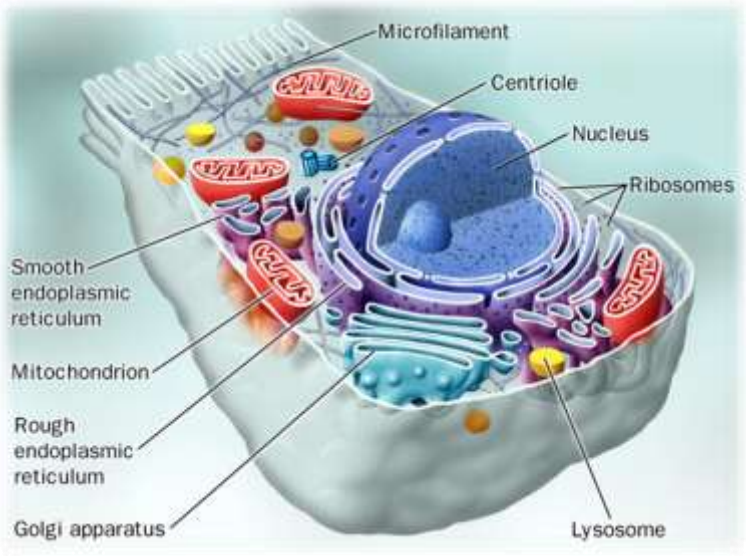
Ribosome, Endoplasmic Reticulum and Golgi Apparatus



Ribosomes

- Small dot-like structures in cells
- They are often associated with forming rough ER
- Ribosomes are the site of protein synthesis in cells
- They are made in the nucleus of the cell
- A ribosome can make the average protein in about one minute

Ribosome Structure

- Ribosomes are made up of proteins and ribonucleic acid(RNA)
- These molecules are arranged into two subunits
- These subunits are attached to each other and together form the entire ribosome
- When viewed through a light microscope the ribosomes appear as dots

Types of Ribosomes

- There are two kinds of ribosomes

  1) Attached to the rough ER

  2) Floating in the cell cytoplasm

- Attached ribosomes make proteins that are used in the ER or transported within the ER

- Free ribosomes make proteins that are used in the cytoplasm

The Endoplasmic Reticulum: Biosynthetic Factory

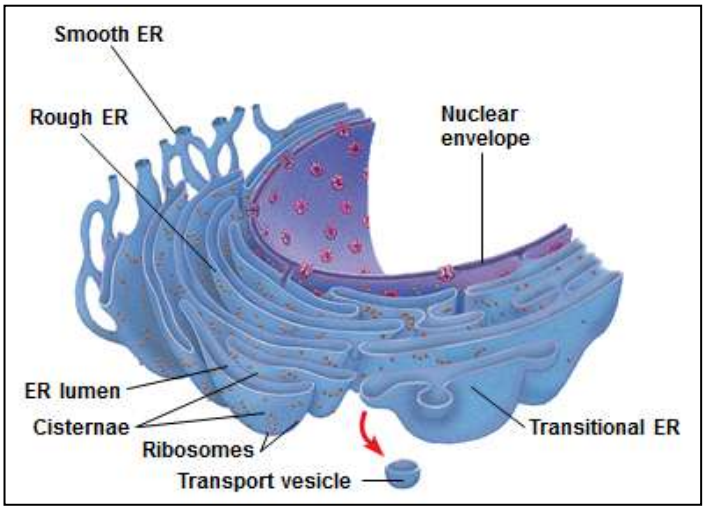
- The **endoplasmic reticulum (ER)** accounts for more than half of the total membrane in many eukaryotic cells

- The ER membrane is continuous with the nuclear envelope

- There are two distinct regions of ER

  – **Smooth ER**, which lacks ribosomes

  – **Rough ER**, surface is studded with ribosomes



Functions of Smooth ER

The smooth ER

– Synthesizes lipids

– Metabolizes carbohydrates

– Detoxifies drugs and poisons

– Stores calcium ions

Functions of Rough ER

The rough ER

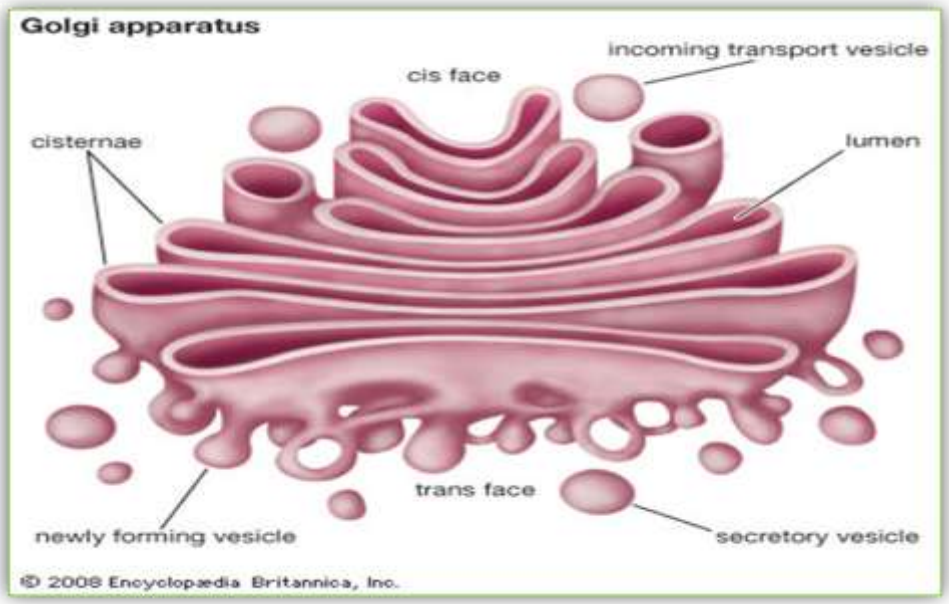
– Has bound ribosomes, which secrete glycoproteins (proteins covalently bonded to carbohydrates)

– Distributes transport vesicles, proteins surrounded by membranes

– Is a membrane factory for the cell

Golgi Apparatus

The Golgi structure is a smooth, curvy structure. It is a flattened stack of membranes. It has a front end and a back end. The front end is called the cis face and the back end is called the trans face. Golgi apparatus has cisternae are the flattened membrane folds and secretory vesicles which are what the cell discharges.



Function of the Golgi apparatus

The basic function of the Golgi apparatus is the transport of proteins within the cell. The Golgi receives materials for transportation through the cis face and sends the materials through to the trans face once they are packaged and modified into the vesicles. It functions in the collection, packaging, and distribution of material. The **cisternae** are the flattened membrane folds of the Golgi apparatus that push together pinching off secretory vesicles containing molecules which are then discharged into the cell.