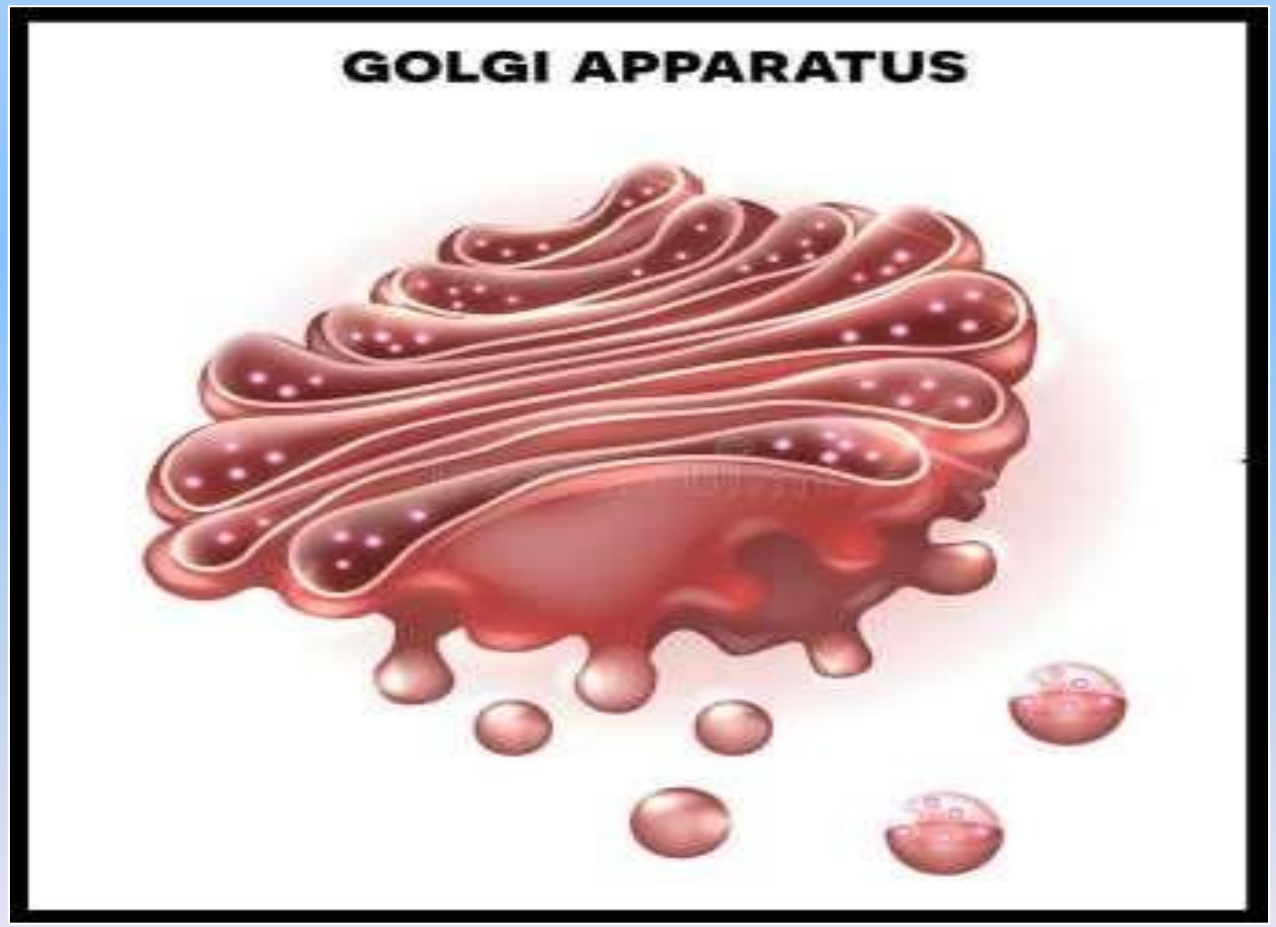
GOLGI APPARATUS



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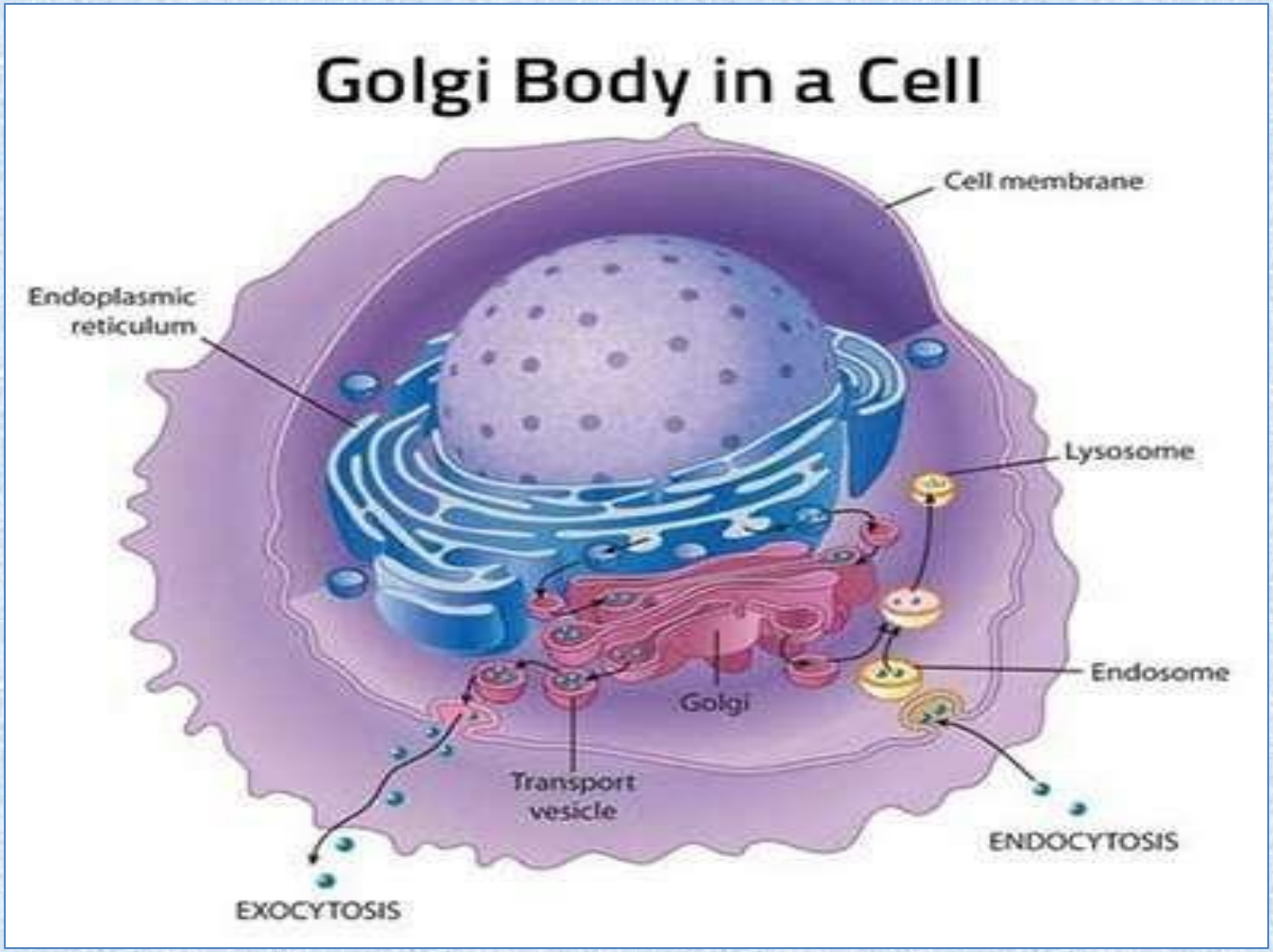
Golgi Apparatus

- The Golgi apparatus (**GA**), also called Golgi body or Golgi complex and found universally in both plant and animal cells,
- It is typically comprised of a series of five to eight cup- shaped, membrane-covered sacs called **cisternae** that look something like a stack of deflated balloons.
- It is another **packaging organelle** like the endoplasmic reticulum (ER). It was named after Camillo Golgi (1897), an Italian biologist.
- While layers of membranes may look like the rough ER, they have a very different function.

- In some unicellular flagellates, however, as many as 60 cisternae may combine to make up the Golgi apparatus.
- Similarly, the number of Golgi bodies in a cell varies according to its function.
- Animal cells generally contain between ten and twenty Golgi stacks per cell, which are linked into a single complex by tubular connections between cisternae.
- This complex is usually located close to the cell nucleus.

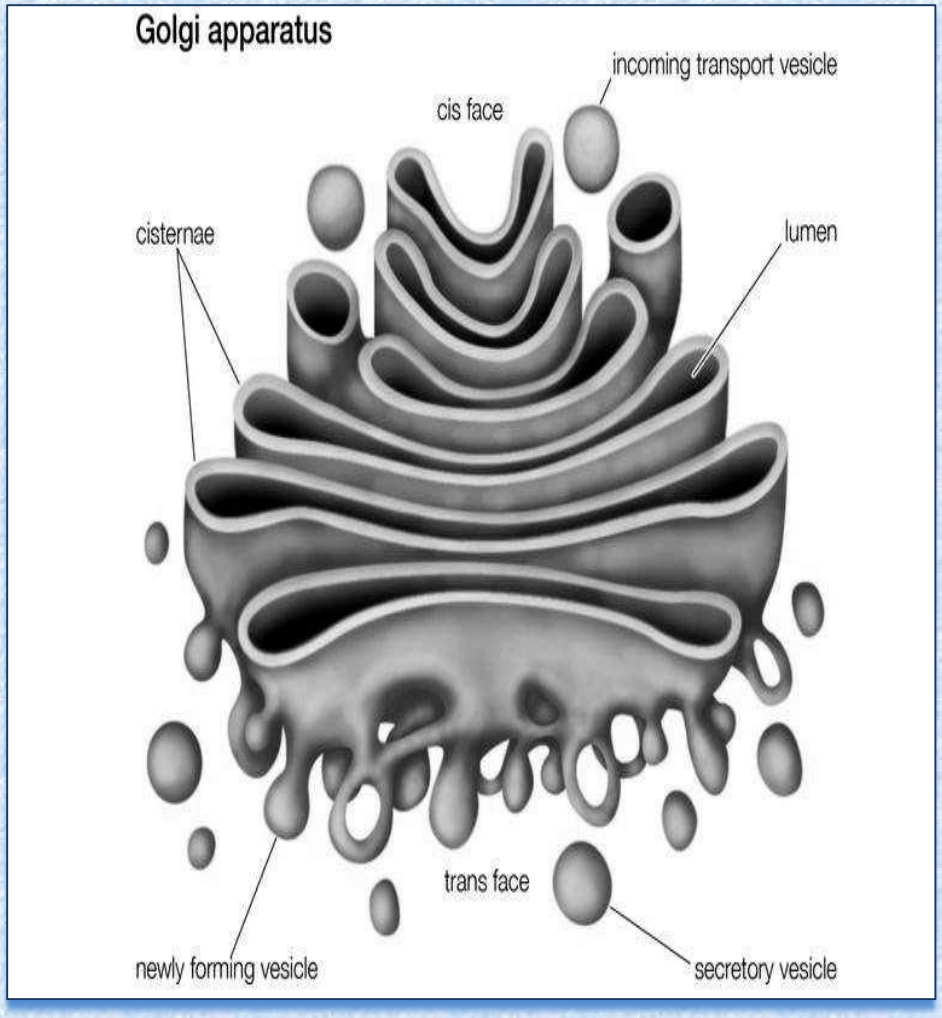
Position in the cell

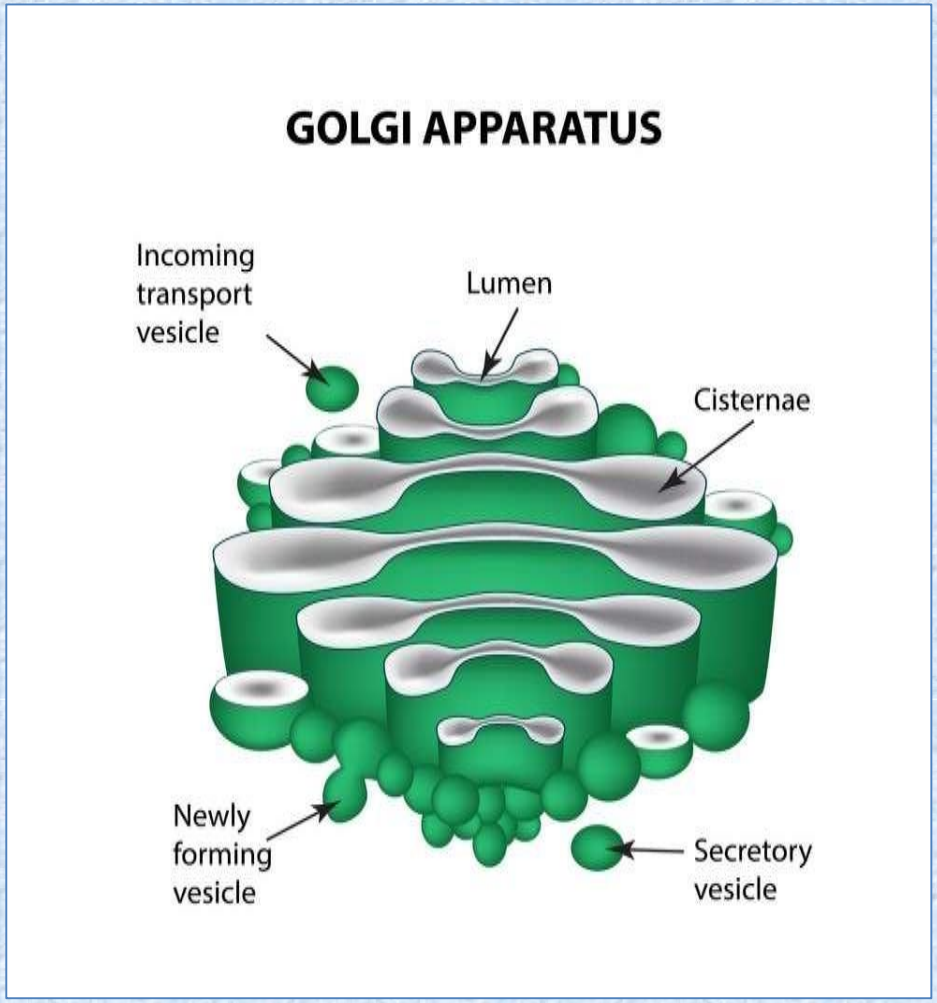


Structure of Golgi Apparatus

- A Golgi apparatus is composed of flat sacs known as cisternae.
- The sacs are stacked in a bent, semicircular shape.
- Each stacked grouping has a membrane that separates its insides from the cell's cytoplasm.
- Golgi membrane protein interactions are responsible for their unique shape.
- These interactions generate the force that shapes this organelle.

Structure


Golgi apparatus
incoming transport vesicle
cis face
cisternae
lumen
trans face
newly forming vesicle
secretory vesicle


GOLGI APPARATUS
Incoming transport vesicle
Lumen
Cisternae
Newly forming vesicle
Secretory vesicle

- The Golgi apparatus is very polar.
- Membranes at one end of the stack differ in both composition and in thickness from those at the other end.
- One end (cis face) acts as the "receiving" department while the other (trans face) acts as the "shipping" department.
- The cis face is closely associated with the ER.

Structure showing Cis and Trans face

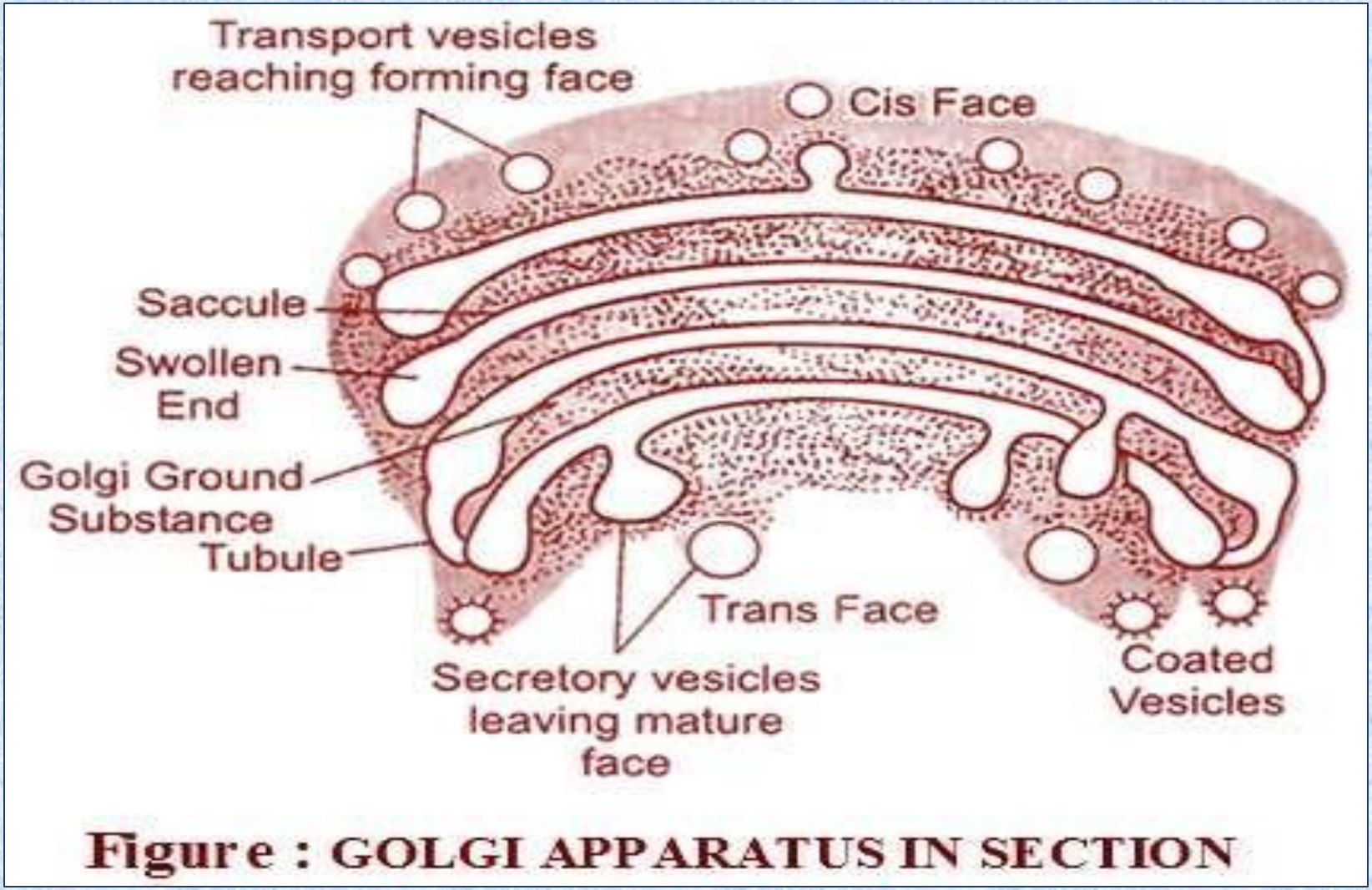


Figure : GOLGI APPARATUS IN SECTION

Functions of Golgi Apparatus

- Golgi apparatus appears to play an important role in the storage, packaging and secretion of certain cell products.
- It is involved in the formation of lysosomes and other enzyme-containing cellular inclusions, and in the formation of secretory granules in cells such as those found in the pancreas, pituitary and mammary glands, and mucous-secreting glands of the intestine and in many other cell types.

In general Golgi complex is of vital importance and serves many functions:

1. **Absorption of compounds.**
2. **Formation of secretory vesicles and secretion.**
3. **Helps in Enzymes formation**
4. **Production of hormones**
5. **Storage of protein**
6. **Formation of Acrosome**
7. **Formation of intracellular crystals**
8. **Milk protein droplet formation**
9. **Formation of plant cell wall:**
10. **Glycoprotein secretion**

- The Golgi apparatus is a critical member of the biochemical manufacturing and supply chain inside a cell. It receives biochemicals in a ‘bulk flow’ from the rough endoplasmic reticulum (RER). It is the only organelle in the cell that receives, sorts, modifies, concentrates, packs and despatches biochemicals for use inside and outside the cell.

- In specialist secretory cells the Golgi complex is responsible for the sorting and packing of such well- known items as insulin, digestive enzymes and pectin.

- The Golgi apparatus produces specialist vesicles or vessels for the transport of its products. Some of these have special wrappings or coatings that help identify the contents. Some vesicles are recyclable.

- Products from the Golgi apparatus go to three main destinations:

(1) inside the cell to lysosomes

(2) the plasma membrane

(3) outside the cell.