

CHAPTER 7

7.0 THE GOLGI COMPLEX AND CELL SECRETION.

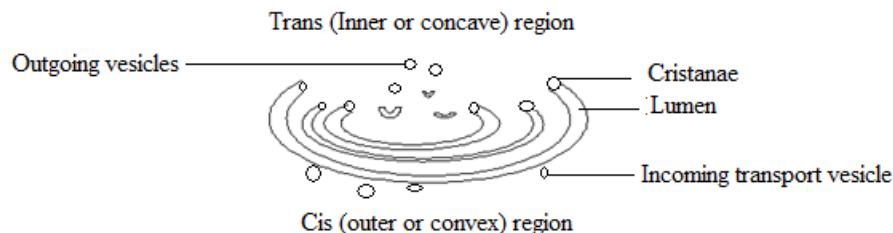
It was Discovered by Italian Cytologist – **Camillo Golgi in 1898**. Are found in plant and animal cells. Number of golgi apparatus depends on the functions of the cell.

7.1 Structure of Golgi complex.

- i) Are stalk of flattened, smooth membrane bounded sacs called cisternae or saccules that vary from five to eight in number.
- ii) Saccules are separated from each other by a few dozen nanometers
- iii) Number of Golgi per cell– vary from a few to 20 or more.
- iv) Membrane of Golgi have a cuplike shape.
- v) Have a variable number of vesicles and membranes channel associated with them.

Small vesicles are often clustered around the saccules appearing as though they are being pinched off from the golgi membranes.

- i) Golgi complex exhibit inherent polarity - it has a Cis and Trans region.
- ii) The Cis region is the outer end of the stalk receiving only synthesized proteins from the ER while the trans region is opposite face.
- iii) In the cuplike shaped (curved) cells Cis is on the convex outer surface of the complex – it is therefore referred to as the **convex or outer** surface. The trans side is called the inner or concave surface.



- iv) The Cis and trans region differ in size, shape, number of associated vesicles and enzymatic activity. This found facing the Endoplasmic reticulum from where most materials to be processed come from. However the trans side is positioned near plasma membrane
- v) The enzyme thiamine pyrophosphatase is a reliable cytochemical marker for the Golgi complex because it is rarely found in other organelles.

7.2 Functions of Golgi complex.

- i) Carbohydrate metabolism- Golgi modify sugar part of glycoprotein by subtracting or adding monomers, manufactures macro-molecules including polysaccharide and pectin that is needed for structure and strength .

- ii) Processing of lipids and proteins produced in endoplasmic reticulum for export to other cells and for transport to other cellular organelles. Protein move by shattering vesicles which bud off endoplasmic reticulum and fuse with Golgi Apparatus where there modified by chopping off some tinny pieces or adding others on the ends.
- iii) Sorting materials produced by the cell and directing them to appropriate locations.
- iv) From electron microscope, the trans side of Golgi complex contain a granular material similar to that seen in vesicles destined for secretion.
- v) Needed in transfer of cholesterol from endolasmic recticulum to plasma membrane
- vi) Some vesicles from Golgi apparatus manure to be lysosmes

7.3 Steps involved in secretion.

- i) Synthesis of secreting polypeptides on ribosomes attached to the RER.
- ii) Segregation and modification of secretory product inside the cysternal space.
- iii) Transport of product to the Golgi complex.
- iv) Sorting concentrating and modifying the secretory products in the Golgi complex.
- v) Storage of final product in secretion granules.
- vi) Discharge of the secretory products from the cell.