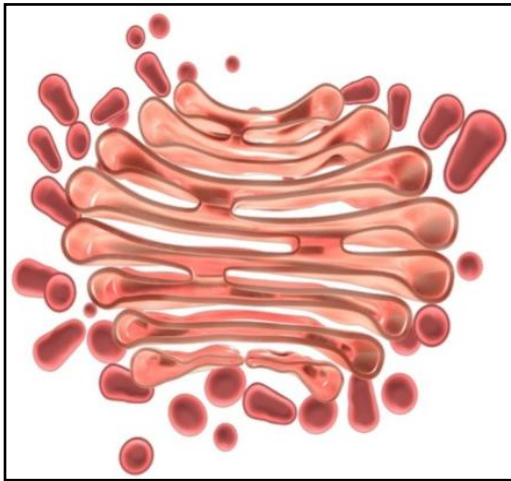


STRUCTURE OF GOLGI APPARATUS

Definition

Golgi apparatus or complex, or body is found in all plant and animal cells and they are groups of flattened disc-like structures located close to the endoplasmic reticulum.



Introduction

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. The Golgi apparatus receives proteins and lipids (fats) from the rough endoplasmic reticulum. It modifies some of them and sorts, concentrates and packs them into sealed droplets called vesicles. Depending on the contents these are despatched to one of three destinations:

Destination 1: within the cell, to organelles called Lysosomes.

Destination 2: the plasma membrane of the cell

Destination 3: outside of the cell.

The Golgi apparatus resides at the intersection of the secretory, lysosomal, and endocytic pathways.

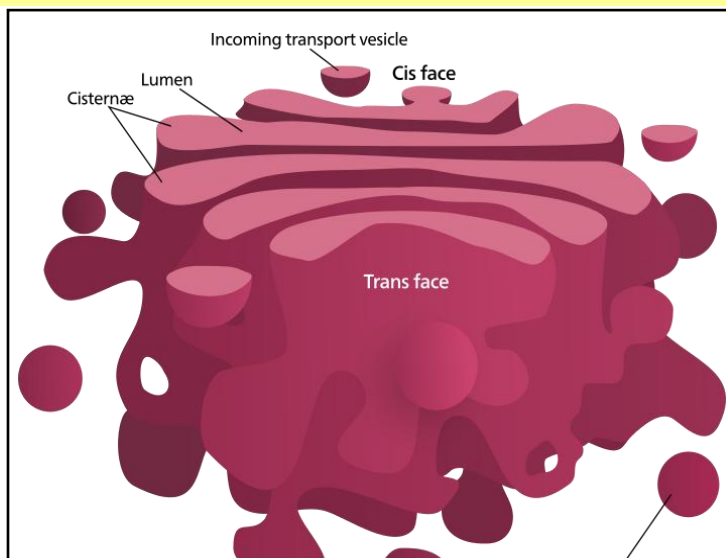
It is of particular importance in processing proteins for secretion, containing a set of glycosylation enzymes that attach various sugar monomers to proteins as the proteins move through the apparatus.

Subcellular localization

Among eukaryotes, the subcellular localization of the Golgi apparatus differs. In mammals, a single Golgi apparatus complex is usually located near the cell nucleus, close to the centrosome.

Animal cells tend to have fewer and larger Golgi apparatus.

Plant cells can contain as many as several hundred smaller versions.

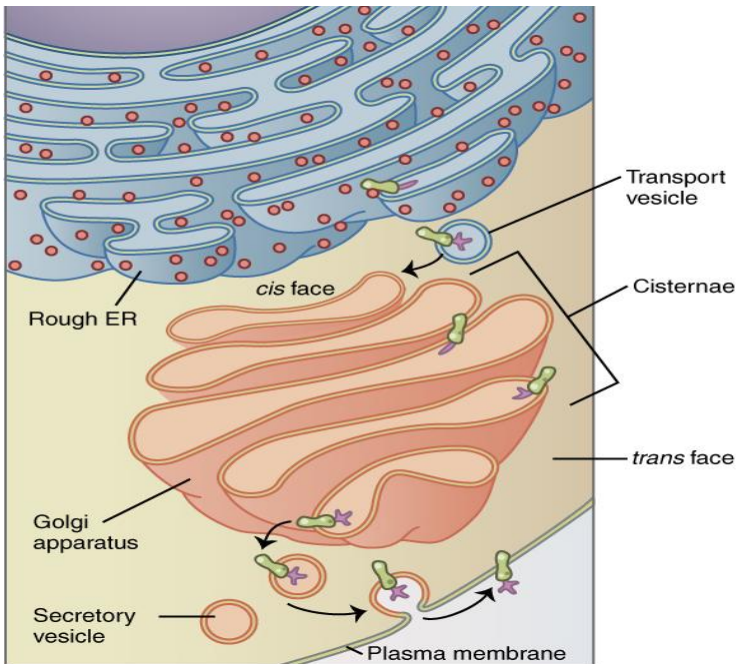


Structure

The Golgi apparatus is made up of a series of compartments consisting of two main networks: the cis Golgi network (CGN) and the trans Golgi network (TGN).

The CGN is a collection of fused, flattened membrane-enclosed disks known as cisternae (singular: cisterna), originating from vesicular clusters that bud off the endoplasmic reticulum. A mammalian cell typically contains 40 to 100 stacks.

The TGN is the final cisternal structure, from which proteins are packaged into vesicles destined to lysosomes, secretory vesicles, or the cell surface. The TGN is usually positioned adjacent to the stacks of the Golgi apparatus. The Golgi apparatus tends to be larger and more numerous in cells that synthesize and secrete large amounts of substances; for example, the antibody-secreting plasma B cells of the immune system have prominent Golgi complexes.



History of nomenclature

The Golgi apparatus is the only cell organelle to be named after a scientist. The visible characteristics of the organelle were first reported by Camillo Golgi (1843-1926) at a meeting of the Medical Society of Pavia on 19 April 1898 when he named it the 'internal reticular apparatus'.

Debate about the existence of the apparatus continued even after 1913 when the term 'Golgi apparatus' was officially given to the 'internal reticular apparatus'. It was not until 1954 that work in electron microscopy finally put the seal of approval on the existence of the organelle and the eponym 'the Golgi' was fully accepted.

GERL

Novikoff proposed the term GERL.

Golgi - Endoplasmic Reticulum - Lysosome complex, a system found in the cell that involves Golgi apparatus, endoplasmic reticulum and lysosomes mainly to perform endocytosis and exocytosis functions.

These organelles form a system that when combined with the endocytotic and exocytotic pathways provide a means by which the cell can

1. process endocytosed and synthesized materials,
2. "Ingest" (endocytose via phagocytosis and pinocytosis) external substances and "Excrete" (exocytose) internal substances
3. Provide for the processing, recycling and removal of wastes from the cell.

