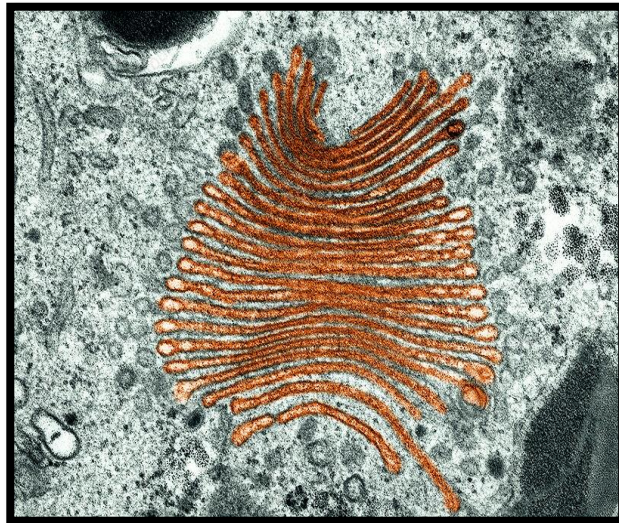
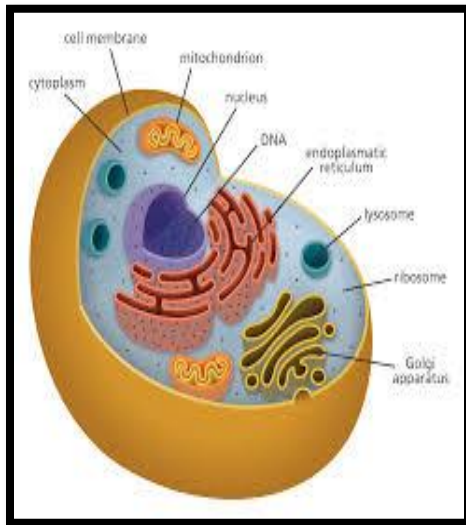




SUBJECT	ZOOLOGY
PaperNo. And Title	V Cell Biology
Module No. and Title	Ultrastructure of Animal cell- Golgiapparatus
Module tag	DAYA-ZOO-golgi

Golgiapparatus -Structure & Function



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Learning Outcomes

The course provides a detailed insight into basic concepts of cellular structure and function.

Understand the structure and function of golgi.

Develop an understanding how protein packing occurs.

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1	Introduction
2	Structure of golgi
3	componentsof golgi
4	Functions of golgi

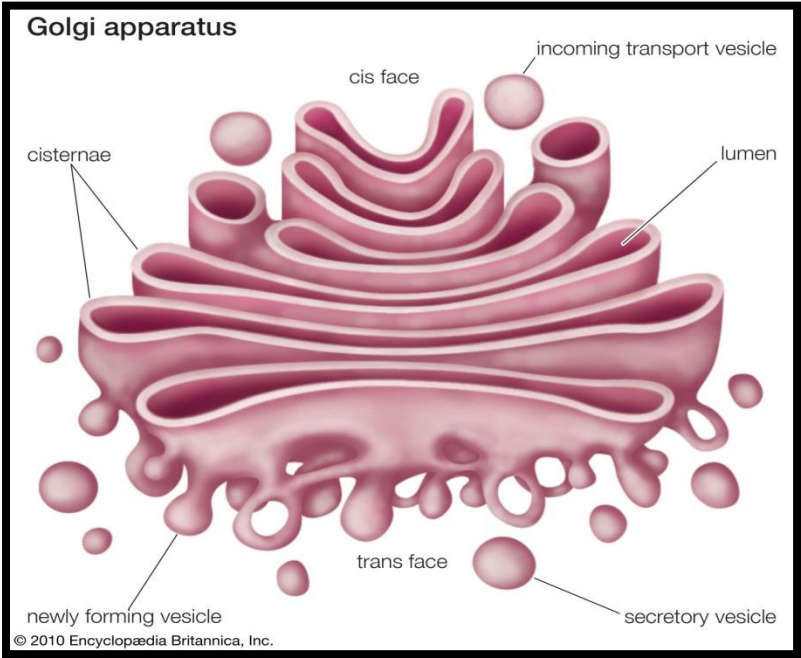
Golgi apparatus

Introduction:

- Camillo Golgi in 1898 discovered a reticular network in the cytoplasm of the cell. He called this network as ‘internal reticular apparatus’.
- The Golgi apparatus also known as Golgi complex, Golgi body or simply Golgi is an membrane bound organelle found in most eukaryotic cells. Absent in prokaryotic cell.
- It is also absent in certain eukaryotic cells like fungi, mature sperm and RBC of animals.
- In animal cell there is a single Golgi complex. Its number varies from animal to animal and from cell to cell.

The Golgi apparatus is responsible for transporting, modifying and packing of proteins and lipids into vesicles for delivery to targeted destination.

Structure of golgi

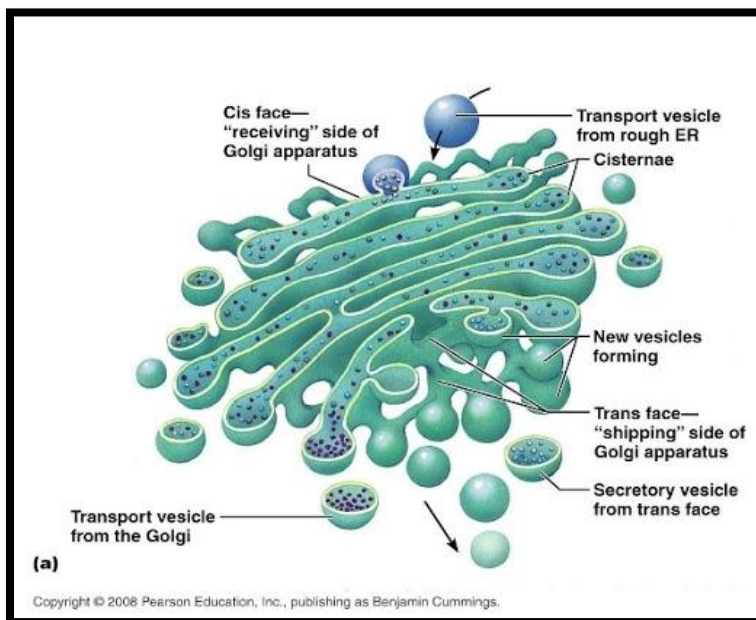


The Golgi apparatus is made up of three membranous components:

1) Flattened sacs or cisternae 2) Small tubules and vesicles 3) Large vacuoles.

1) **Flattened sacs or cisternae:**

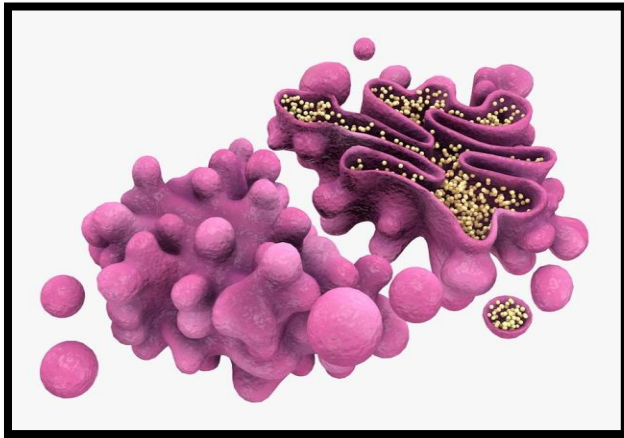
- Cisternae are flattened, plate like or saucer-like, closed compartments. The diameter of it is about $1\mu\text{m}$. They are held in parallel bundles or stacks one above the other.
- In each stack, the cisternae are separated by a space of 20 to 30 nm.
- Size and number of the cisternae exhibits variation. The number is usually between 4 to 8 in most animal and plant cells.
- Each cisterna is bounded by smooth unit membrane having 7.5 nm thickness.
-



- All cisternae are interconnected, due to which the Golgi complex appears as a system of branched tubules.

- The cisternae are stacked together and number of small vesicles remain associated with each cisternae.
- Each stack of cisternae has two faces, namely cis face and trans face.
- The entry face receives the vesicles coming from ER , it is called as cis face. The cis face is characterised by presence of small vesicles or tubules. The second face is exit face or trans face, from where Golgi vesicles leave the complex.

2) Small tubules and vesicles:



- From peripheral area of cisternae arise a complex flat network of tubules.
- It is of 300 to 500 A in diameter.
- The vesicles are droplet like sacs. They remain attached to the tubules at the periphery of the cisternae.
- The vesicles are of three types namely,
 - Transitional vesicles
 - Secretory vesicles

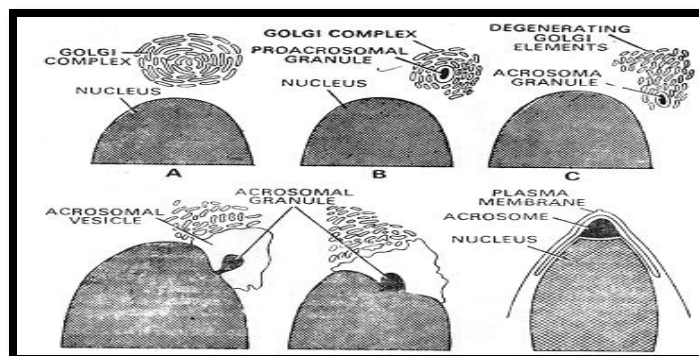
- Clatherin coated vesicles.
- Transitional vesicles: They are small membrane limited vesicles. They are formed as a blebs from the ER to migrate and converge to cis face of Golgi.
- Secretory vesicles: They are also called as smooth vesicles which are of 20 to 80 μm in diameter. They contain secretory material. They discharge from the margins of cisternae of Golgi. They often occur between maturing face of Golgi and the plasma membranes.
- Clatherin coated vesicles: They are spherical protuberances about 50 μm in diameter with rough surface. They are found at periphery of the Golgi. These vesicles play role in intracellular traffic of membranes and secretory products.

3) Large Vacuoles:

- The vacuoles are clear and lie at the edge of the Golgi complex.
- They are formed by expanded cisternae or by fusion of secretory vesicles.
- The vacuoles are filled with amorphous or granular substance.

Functions of the Golgi apparatus

- During spermiogenesis (maturation o sperms) the Golgi complex plays a role in the formation of acrosome.



- Golgi complex is considered to play some role in the secretory functions of the cell.
- During cell division, during cytokinesis a cell plate is formed by the involvement of the Golgi body.
- The vesicles and vacuoles of Golgi complex are used for storage of lipids and proteins in secretory cells.

Links

https://docs.google.com/document/d/1QnXllcm1m4PFcSEWeDN7qyA_F3lpJy3FeVjCvIKUirg/edit?usp=sharing

Vedio

<https://drive.google.com/file/d/14Gwzy4g8jkQyRyfdpiCKsp6l8w5YwIOP/view?usp=sharing>

<https://drive.google.com/file/d/14aSVmb4jQELeA2b0mnECLwINN6XCL8cY/view?usp=sharing>

Explore more

1. Karp, G. (2010) Cell and Molecular Biology: Concepts and Experiments (6th edition) John Wiley & Sons. Inc.
2. De Robertis, E.D.P. and De Robertis, E.M.F. (2006) Cell and Molecular Biology (8th edition) Lippincott Williams and Wilkins, Philadelphia.
3. Cooper, G.M. and Hausman, R.E. (2009) The Cell: A Molecular Approach. (5th edition) ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA
4. Becker, W.M.; Kleinsmith, L.J.; Hardin. J. and Bertoni, G. P. (2009) The World of the Cell. (7th edition) Pearson Benjamin Cummings Publishing, San Francisco.

ASSESSMENT

Module / Topic: CellBiology			
Year: SYBSc-Sem-III			
ILO	Teaching Activity	Assessment Type	Assessment Mode & Tool
1.Students will be able to draw neat labelled diagrams of different components of golgi		Strategies Used Explanation & drawing the diagram. Showing models and discussing. Ask students to prepare animation PPT's	Assessment type: Draw a chart of the different parts of Cell Give a diagrammatic sketch with arrows and ask them to label the different parts. Sketch & label golgiapparatus
			Google class room code:un5po2c
2. Students will be able to differentiate between components of golgi		Strategies Used Quiz, MCQ https://docs.google.com/document/d/1o_8fa3y7FH2f10XdWp0T1esK4-zRnInj26_PPbuQ5Dk/edit	Assessment type: Grading till they are able to get minimum score of 60%
3.To explain the mechanism & functions of golgiapparatus		Strategies Used Explanation- Concept map	Give a concept map with blanks in different columns to be filled by the students, Quiz, https://forms.gle/dJ2EJBG5adFU YsPd7 MCQ, Short answers
			MCQ's Class test .https://forms.gle/dJ2EJBG5adFU MOODLE LMS has these activities which can be designed

