

By .

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DII H/S - Zoology -

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Lecture - 7

GOLGI COMPLEX

An eukaryotic cytoplasmic organelle.

9 First discovered by an Italian Physician & Noble Laureate Camillo Golgi in 1898 during an investigation of the nervous system.

10 The Golgi app. is noticeable with both light & Electron microscope

Membrane bound organelles, which are sac like
12 Found in cytoplasm of most eukaryotic cells and absent in prokaryotes, Mammalian RBCs & sperm cells of bryophytes.

Structure of Golgi apparatus.

2 - it is made up of several stack of parallel, flattened sac or cisternae.

3 - many peripheral tubules & vesicles.

CISTERNAE

4 1) Golgi app. is made up of approx 4-8 cisternae

2) usually equally spread (space) in stark separated from each other by thin layer of intercisternal cytoplasm

5 3) It has a distinct polarity, the two poles are cis & trans surface responsible for receiving and shipping departments.

3) Forming (cis) face convex side of stack, Maturing (trans) face concave side of stack.

4) Secretory material from smooth endoplasmic reticulum via transport vesicles reaches golgi bodies

NOTE TUBULES & VESICLES

Tubules - small round tubules formed from the periphery of the cisternae.

And few get enlarged & concave surface of the Golgi bodies.

MAY
2019

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2019

APRIL
TUESDAY

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GOLGI - Complex - contd.

VESICLES - lie near the end of Concave surface of golgi complex.

Types of vesicles - Smooth vesicles & coated vesicles.

Golgi Matrix - Smooth vesicles & all golgi complex filled with a fluid.

Modification in CGN (cis golgi network) & TGN (trans golgi network).

- TWO networks the cis Golgi network (CGN) & Trans Golgi network (TGN) are made up of outermost cisternae at the cis & trans face.

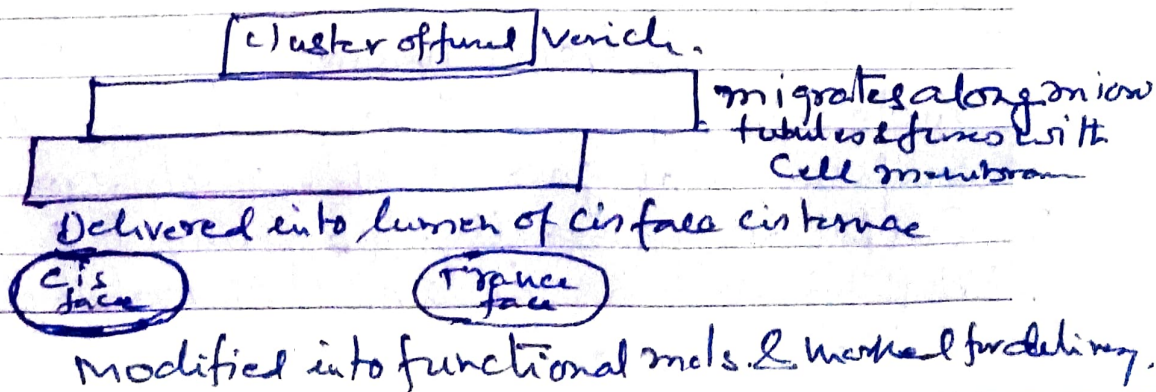
- Vesicles containing proteins from the Endoplasmic Reticulum (ER) merge with the CGN and allowing protein to enter Golgi complex.

- As CGN receives protein from the ER it begins these modification moving along membrane to membrane towards the TGN.

- At the other end of Golgi complex, newly modified protein arrives at the TGN where it sorts off to different parts of cell via transport vesicles.

PATHWAY:
Protein & lipid

NOTES



FUNCTIONS

Secretion

Synthesis

Sulfation

Apoptosis.

Phosphorylation

Secretion - Golgi complex plays an important role in secretion $\rightarrow$ Production of Proteoglycans

Path of secretion.

1) Nuclear membrane

2) Nuclear pore.

3) Rough endoplasmic reticulum

4) Smooth endoplasmic reticulum (SER)

5) Ribosomes attached to RER

6) Macromolecules.

7) Transport vesicles.

8) Golgi apparatus.

9) Cis face of Golgi apparatus.

10) Trans face of Golgi apparatus.

11) Cisternae of the Golgi apparatus.

Synthesis $\rightarrow$ It is also major site of carbohydrate synthesis.

2) Induces synthesis of glycosaminoglycans.

3) Golgi app. to Polysaccharides and Proteins to form proteoglycans.

Sulfation $\rightarrow$

1) Golgi involves in the sulfation of certain molecules passing through lumen via Sulfo transferases that gain sulphur mole. from a donor APS.

2) Sulfation generally performed in trans golgi apparatus.

3) Sulfation occurs in GAGs of proteoglycans as well as core protein.

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2019

APRIL
THURSDAY

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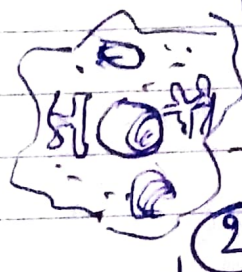
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- 4) Level of sulfation is important to Polysaccharides.
- APOPTOSIS → has a putative role in apoptosis.
- A newly characterized protein (Golgi antiapoptotic protein) almost exclusively, resides the Golgi & protects cells from apoptosis.
- As yet it is an undefined mechanism.

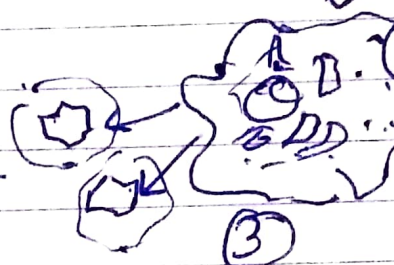


Cell damaged
stressed by
body signals
↓ apoptosis



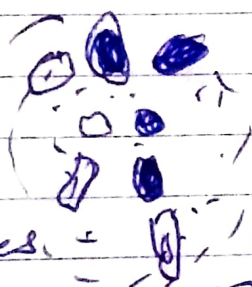
The cell begins
to shrink &
form blebs.
Proteins are acti-
vated to break
2 cellular
components

(2)



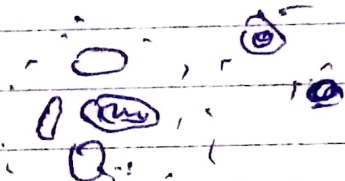
Enzyme break
down nucleus
& the cell emits
signals to attract
macrophages

(3)



(4)

The cell
breaks into
several pieces.
Contain the cell comp.
& destroyed nuclei



Macrophages recognize the cell
parts & remove them from the body.

PHOSPHORYLATION

Phosphorylation of mol. require

energy in the form of ATP.

NOTES

The ATP is imported in the lumen of Golgi which is
utilized by Casein Kinase I & Casein Kinase II.
Apolipoprotein — forms a mol. VLDL (Constituent of blood
serum).