

# YAKEEN NEET 2.0

**2026**

**Cell - The Unit of Life**

**Botany**

**Lecture - 05**

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## Topics to be covered

1

ER

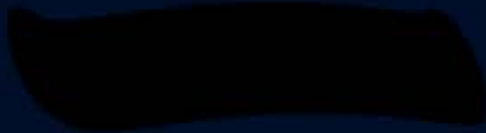
2

GB

3

Lysosome

4



T-1 = ②

T-2 = ①

T-3 = ③

T-4 = ②

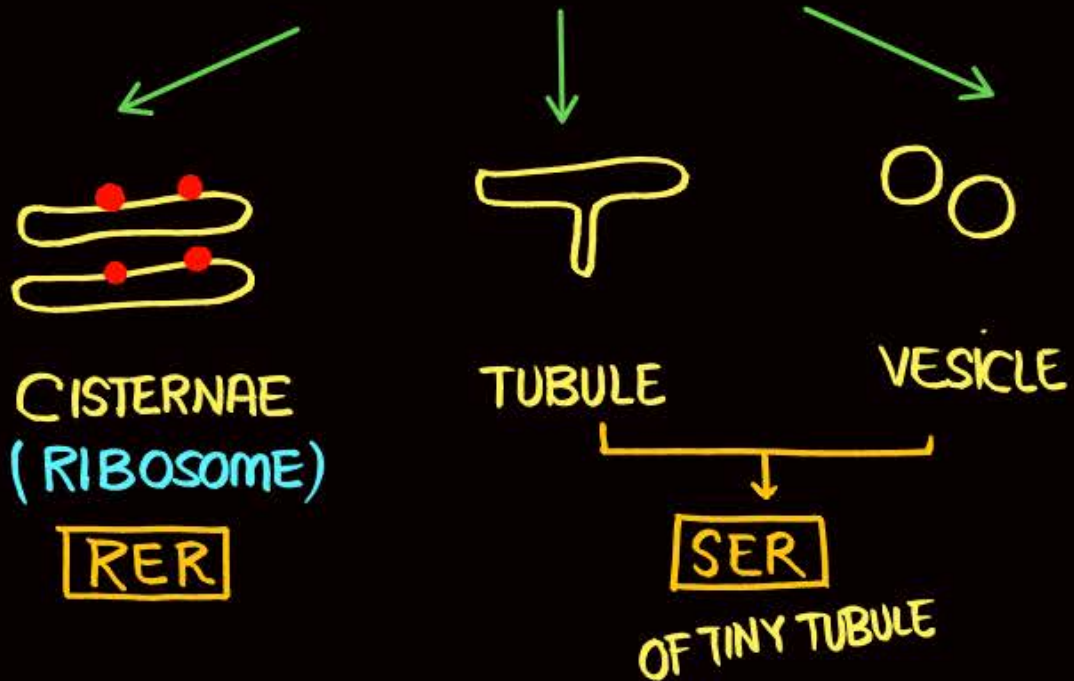
T-5 = ①

Before 11



## ER

CONSIST OF THREE PARTS.



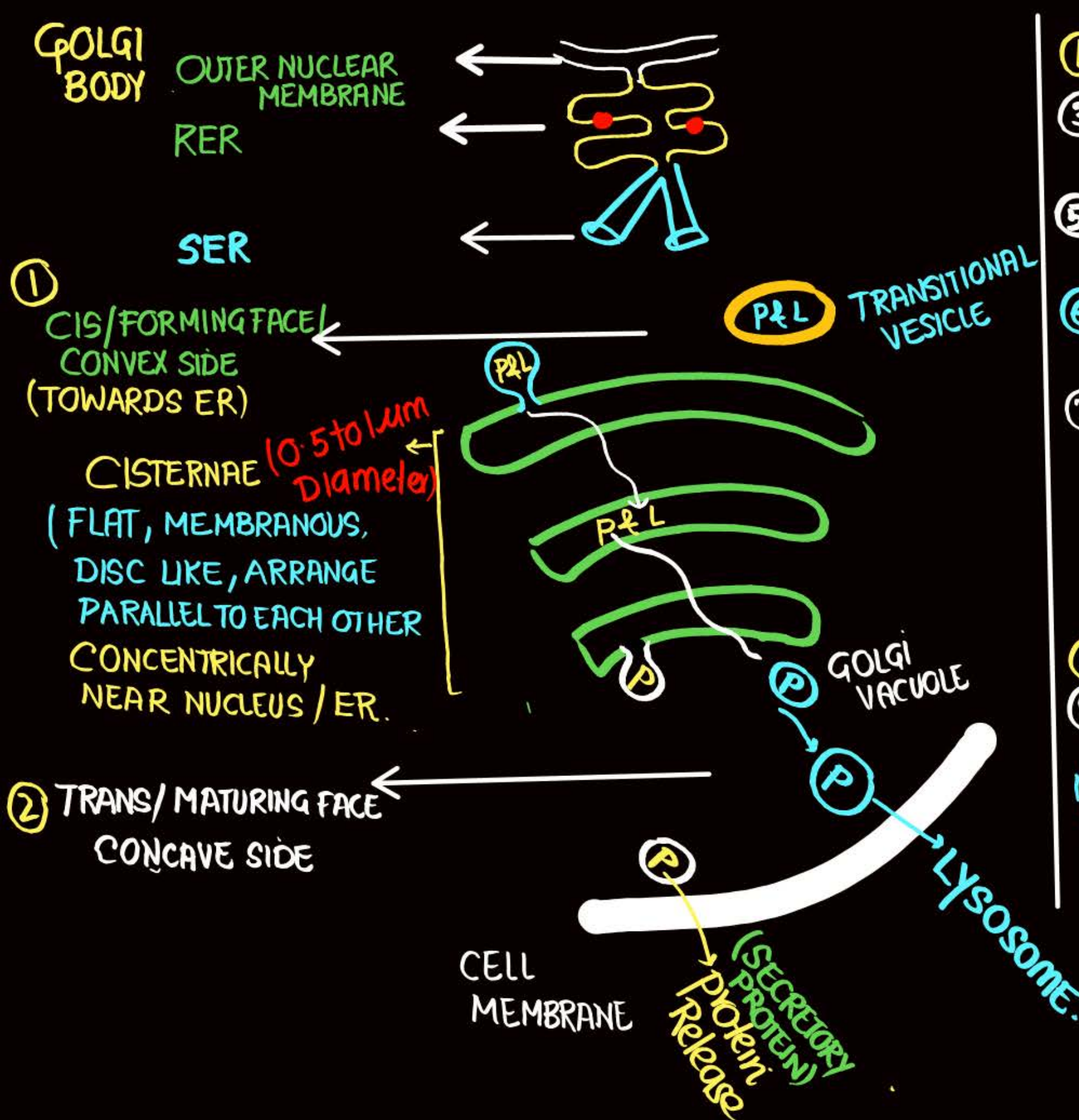
★ NETWORK/RETICULUM SCATTERED IN CYTOPLASM.

## EXTRA

- ① DETOXIFICATION OF DRUG (SER)
- ② SARCOPLASMIC RETICULUM (SER)  
↓  
STORE  $Ca^{+2}$  → MUSCLE CONTRACTION
- ③ NISSIL BODY : BRAIN  
(ER + RIBOSOME)

SKIP





- ① RER SYNTHESIS PROTEIN
  - ② PROTEIN MOVES FROM RER TO SER
  - ③ SER SYNTHESIS LIPID
  - ④ NOW SER RELEASE TRANSITIONAL VESICLE WHICH CARRY PROTEIN & LIPID (P & L)
  - ⑤ TRANSITIONAL VESICLE MOVES TOWARDS CIS SIDE OF GOLGI BODY.
  - ⑥ PROTEIN & LIPID TRANSFER INTO COATED VESICLE OF GOLGI BODY AT CIS SIDE (PACKAGING OF MATERIAL).
  - ⑦ PROTEIN & LIPID MOVES FROM COATED VESICLE TO CISTERNAE
 

PROTEIN + SUGAR → GLYCOPROTEIN

LIPID + SUGAR → GLYCOLIPID

MODIFICATION OF PROTEIN & LIPID

GLYCOSYLATION / GLYCOSIDATION OF PROTEIN & LIPID
  - ⑧ MOST OF PROTEIN ENTER INTO SECRETORY VESICLE
  - ⑨ SECRETORY VESICLE SEPERATED & RELEASE THEIR PROTEIN OUTSIDE THE CELL
- NOTE: MATERIAL MOVES FROM CIS TO TRANS. SIDE
- NOTE: SOME PROTEIN COMES FROM CISTERNAE IN THE FORM OF GOLGIAN VACUOLE & THIS GOLGIAN VACUOLE CAN REFERED AS **LYSOSOME**



NOTE \* GOLGI (1898): DENSELY STAIN STRUCTURE NEAR NUCLEUS.

\* RER PROVIDE ENZYMES/PROTEIN FOR SYNTHESIS OF LYSOSOME

\* LYSOSOME FORMED FROM GOLGI BODY.

① IT HELPS IN ACROSOME FORMATION.  CONE LIKE

② PACKAGING → MODIFICATION → DELIVER OUTSIDE CELL (CELL SECRETION)

③ CYTOKINESIS IN PLANT

NOT: CIS & TRANS → INTERCONNECTED  
BOTH FACE ARE  
DIFFERENT

\* NO. OF CISTERNAE: VARY IN GOLGI BODY.

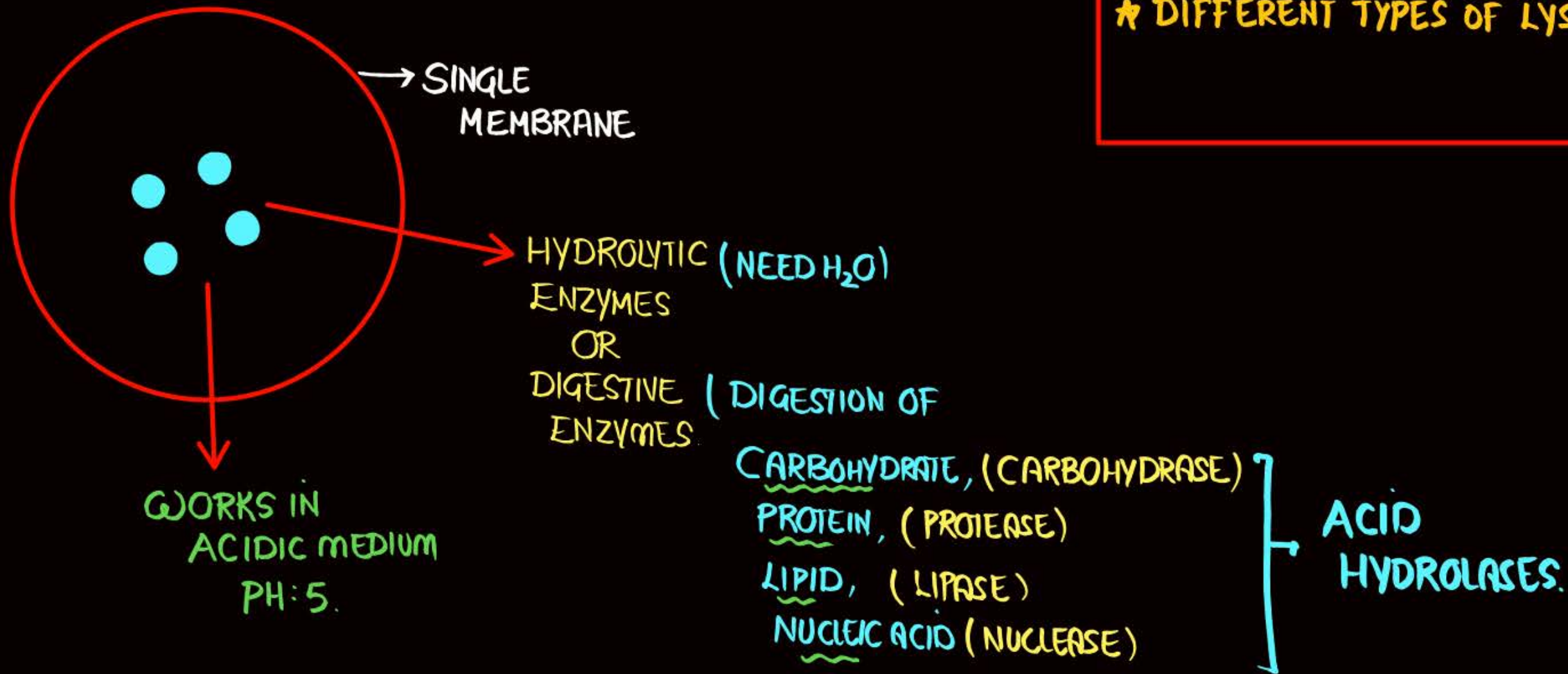
( PLEOMORPHIC ORGANELLE )

EXTRA.

\* PLANT: DICTYOSOME  
( GOLGI BODY )

EXTRA

# LYSOSOME



★ FROM GOLGI BODY DUE TO PACKAGING : PRIMARY LYSOSOME

★ DIFFERENT TYPES OF LYSOSOME : POLYMORPHIC ORGANELLE



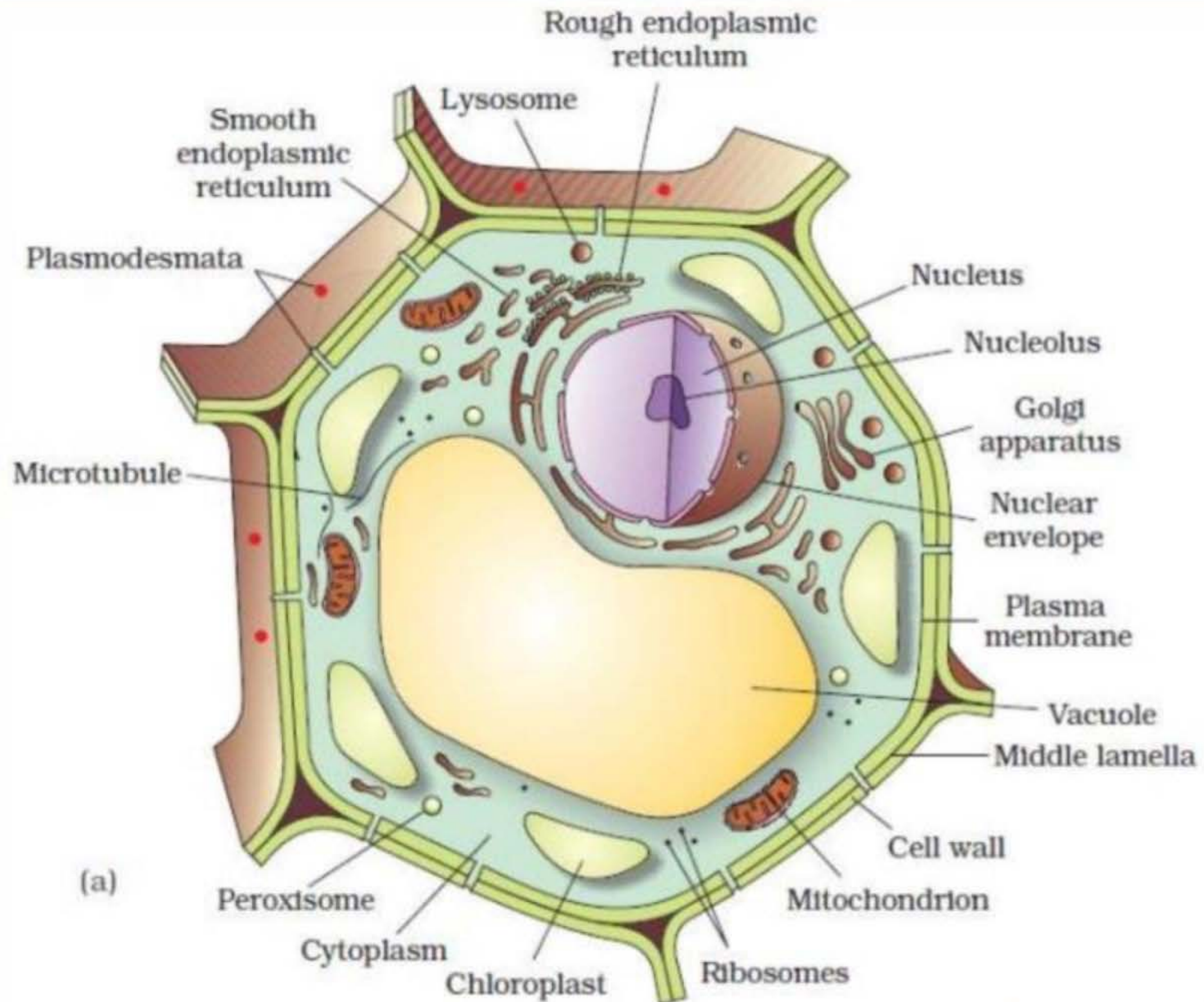
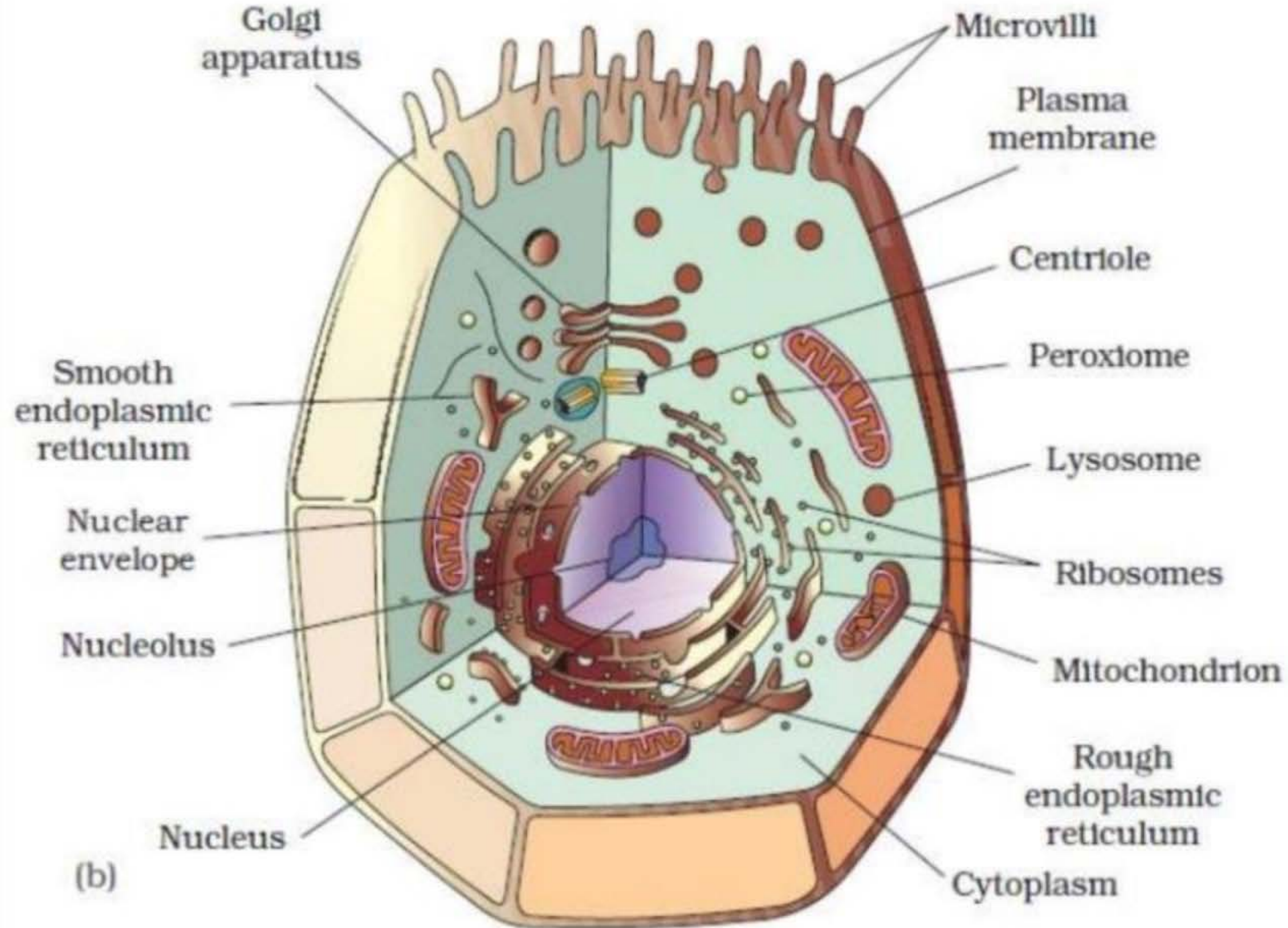


Figure 8.3 Diagram showing : (a) Plant cell (b) Animal cell



**Figure 8.3** Diagram showing : (a) Plant cell (b) Animal cell



### 8.5.3.1 The Endoplasmic Reticulum (ER)

Electron microscopic studies of eukaryotic cells reveal the presence of a network or reticulum of tiny tubular structures scattered in the cytoplasm that is called the endoplasmic reticulum (ER) (Figure 8.5). Hence, ER divides the intracellular space into two distinct compartments, i.e., luminal (inside ER) and extra luminal (cytoplasm) compartments.

→ inside cell.

ER

- (A) tiny tubular structure. Membrane ~~less~~ scattered in cytoplasm
- (B) ER Divides ~~inter~~cellular space into two compartment Reason
- (C) luminal (~~outside~~ ER) & extra luminal (cytoplasm)
- ☒ (D) all are incorrect



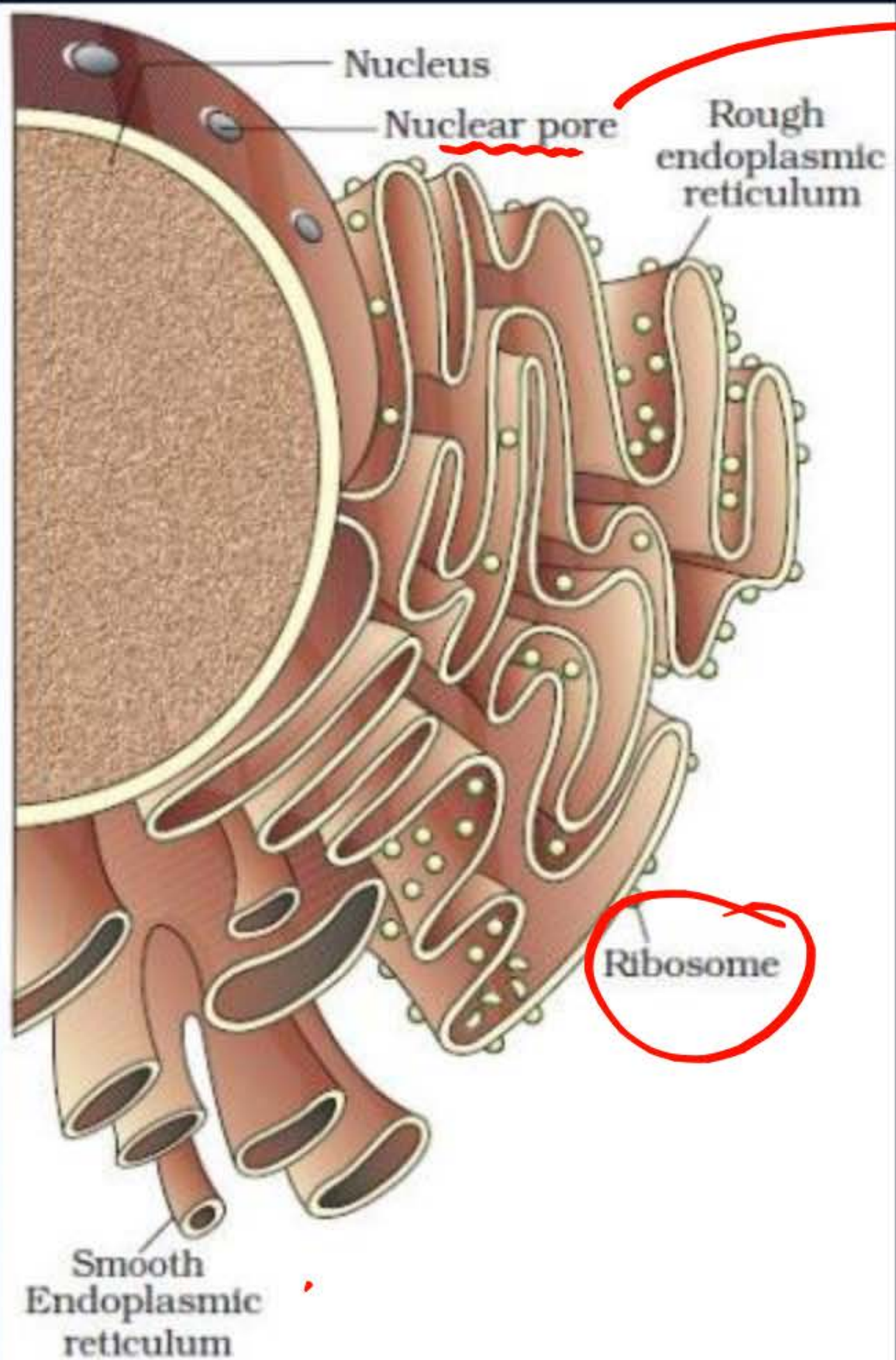


Figure 8.5 Endoplasmic reticulum



The ER often shows ribosomes attached to their outer surface. The endoplasmic reticulum bearing ribosomes on their surface is called rough endoplasmic reticulum (RER). In the absence of ribosomes they appear smooth and are called smooth endoplasmic reticulum (SER).

RER is frequently observed in the cells actively involved in protein synthesis and secretion. They are extensive and continuous with the outer membrane of the nucleus. *→ widespread*

The smooth endoplasmic reticulum is the major site for synthesis of lipid. In animal cells lipid-like steroidal hormones are synthesised in SER.

RER (correct)

- ☒ A. Ribosome present so rough
- ☒ B. protein synthesis & secretion
- ☐ C. extensive, continuous with ~~inner~~ nuclear membrane
- ☒ D. SER : ribosome absent, synthesis lipid & glycogen
- ☐ E. In ~~plant~~ cell lipid like steroid hormone are synthesis by SER
- ☐ F. ER ~~not~~ help in transport of substance

(A) 2

☒ (B) 3

(C) 4

(D) 5



### 8.5.3.2 Golgi apparatus

<sup>NET LIKE</sup>  
 Camillo Golgi (1898) first observed densely stained  
 reticular structures near the nucleus. These were  
 later named Golgi bodies after him. They consist  
 of many flat, disc-shaped sacs or cisternae of  
 0.5 $\mu$ m to 1.0 $\mu$ m diameter (Figure 8.6). These are  
 stacked parallel to each other. Varied number of  
 cisternae <sup>ONE ABOVE OTHER</sup> are present in a Golgi complex.

#### Correct

- A. Camilo Golgi (1808) observed lightly stain structure
  - B. It present near nucleus
  - C. GB consist of flat, disc like cisternae which are parallel to each other
  - D. cisternae number <sup>vary</sup> fixed in GB
  - E. Cisternae concentrically arranged near mitochondria
- (A) 1      (B) 2      (C) 3      (D) 4



The Golgi cisternae are concentrically arranged near the nucleus with distinct convex *cis* or the forming face and concave *trans* or the maturing face. The *cis* and the *trans* faces of the organelle are entirely different, but interconnected.

### Correct

- (A) Cis face / forming face towards cell membrane
- (B) both cis & trans face are same & interconnected
- (C) perform packaging of material to deliver intracellular target only
- (D) all are incorrect

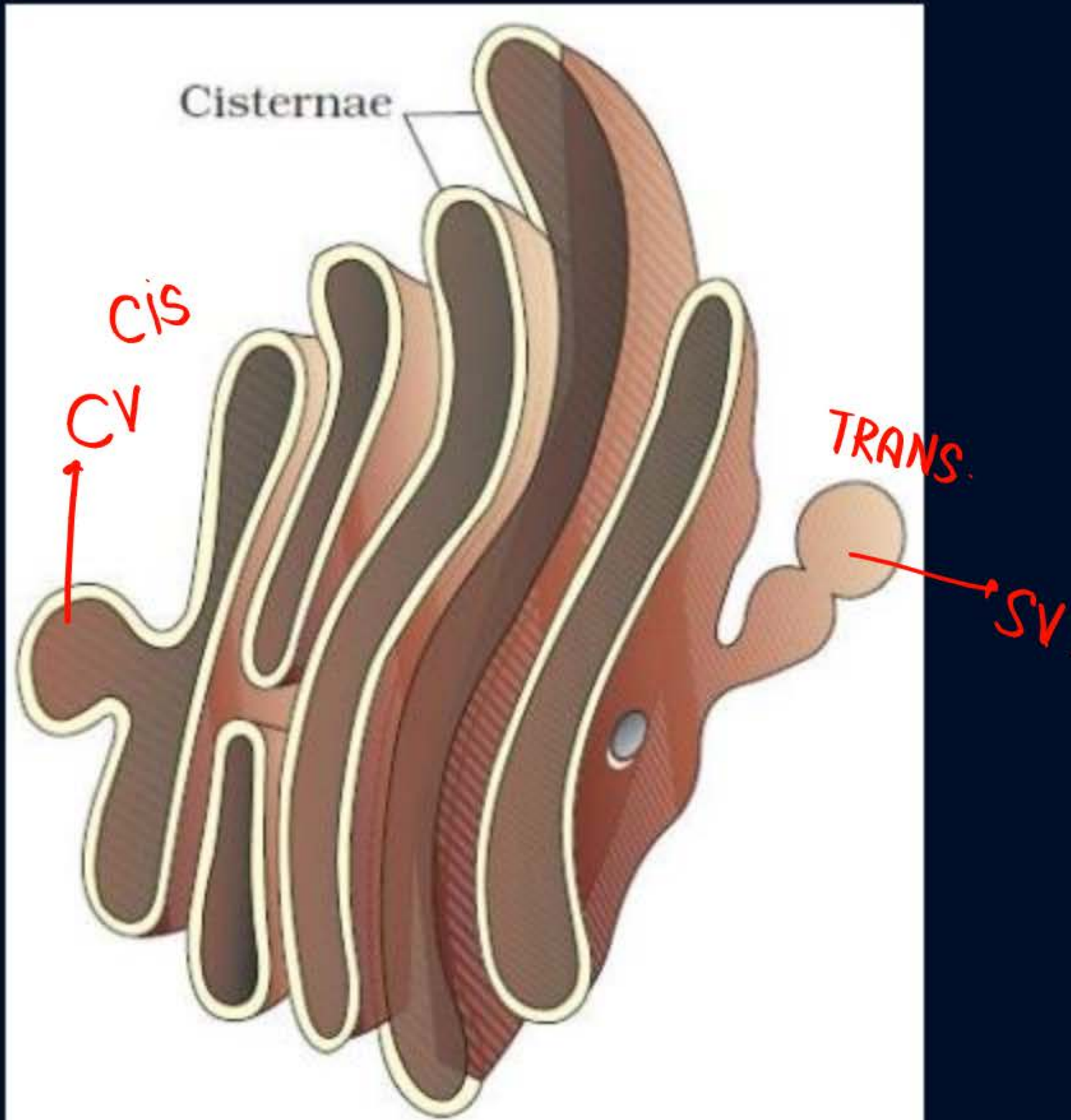


Figure 8.6 Golgi apparatus



The golgi apparatus principally performs the function of packaging materials, to be delivered either to the intra-cellular targets or secreted outside the cell. Materials to be packaged in the form of vesicles from the ER fuse with the *cis* face of the golgi apparatus and move towards the maturing face. This explains, why the golgi apparatus remains in close association with the endoplasmic reticulum.

Cis side (coated vesicle).  
 TRANSITIONAL VESICLE  
 Inside cell (PROTEIN WHICH COMES OUT IN FORM OF LYSOSOME)

↑ SECRETORY PROTEIN (SECRETORY VESICLE)

Correct

- (A) material in form of vesicle comes from ER towards cis face of Golgi body
- (B) material move from trans face to cis face ✗
- (C) cis face also called maturing face ✗
- (D) all are incorrect

(9)

**Assertion (A) :** Material move from ER to Cis face of Golgi Body

**Reason (R) :** that's why Golgi body associated with ER

- (A) Both A and R are true and R is the correct explanation of A.
- (B) Both A and R are true but R is NOT the correct explanation of A.
- (C) A is true but R is false.
- (D) A is false but R is true.

(9)



glycosylation

RER

A number of proteins

synthesised by ribosomes on the endoplasmic reticulum are modified in the cisternae of the golgi apparatus before they are released from its *trans* face. Golgi apparatus is the important site of formation of glycoproteins and glycolipids.

Correct

- (A) protein synthesis by ribosome of ER modified in cisternae part of ER ~~✓~~ GOLGI BODY AFTER ✓
- (B) before modification protein released from trans face
- ✓ (C) Golgi body is site of formation of glycoprotein & glycolipid
- (D) all are correct



### 8.5.3.3 Lysosomes

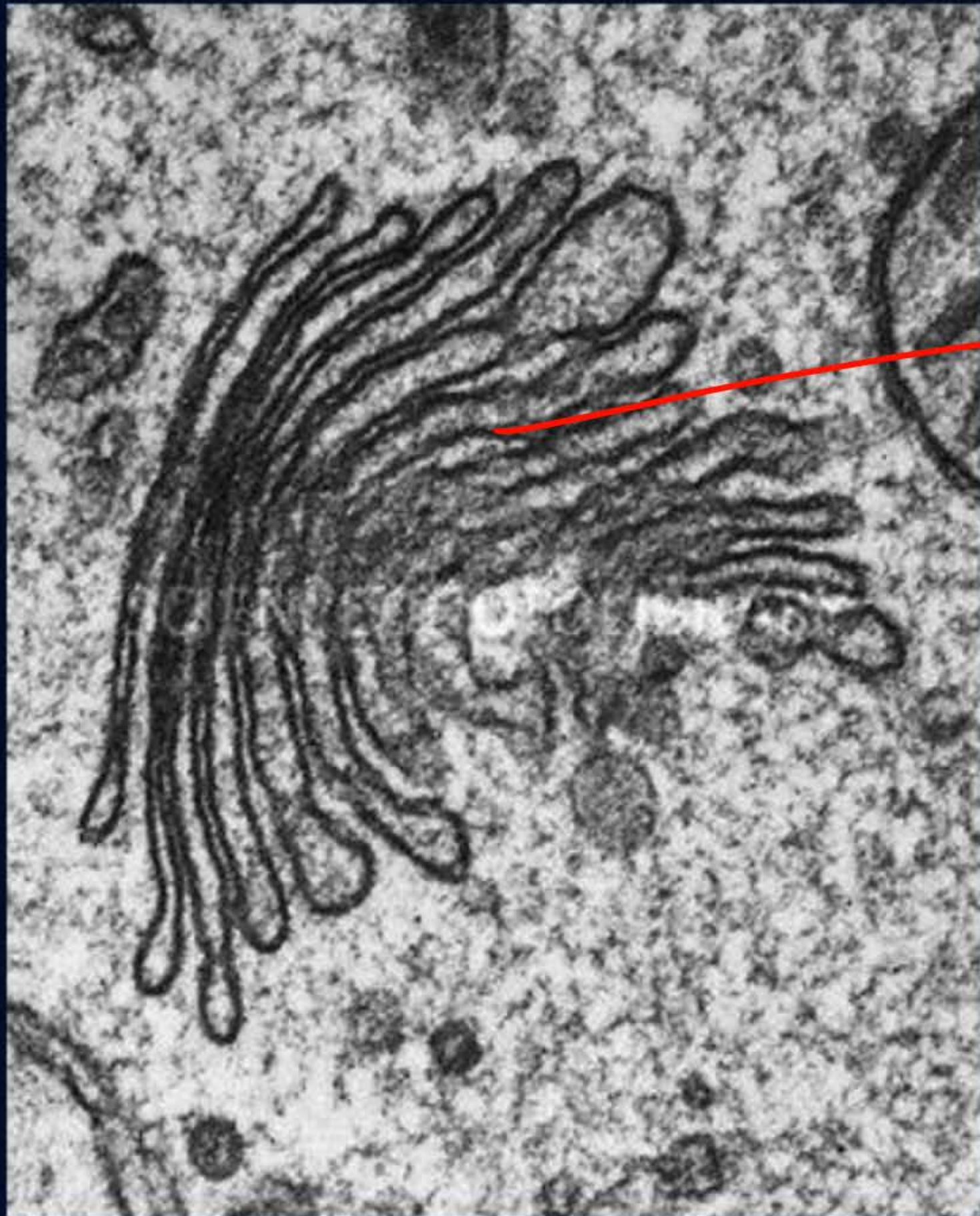


These are membrane bound vesicular structures formed by the process of packaging in the golgi apparatus. The isolated lysosomal vesicles have been found to be very rich in almost all types of hydrolytic enzymes (hydrolases – lipases, proteases, carbohydrases) optimally active at the acidic pH. These enzymes are capable of digesting carbohydrates, proteins, lipids and nucleic acids.

#### Lysosome

- ☒ A. double membrane
  - ☒ B. former by packaging in ER
  - ☒ C. rich in hydrolytic enzymes work in basic medium
  - ☒ D. enzymes work in acidic medium PH-5
  - ☒ E. enzymes digest carbohydrate protein only
- (A) 0      (B) 1      (C) 2      (D) 3





densly  
stain



**THANK**  
**YOU**