



# BIOLOGIE

# CELULARA SI MOLECULARA

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LP03. Tehnici de evaluare structurală și funcțională a organitelor celulare.



# Biologie Celulara si Moleculara

## *Modul Biologie celulara:*

Notiuni microscopie

Evaluare organite celulare;

Culturi de celule;

## *Modul Biologie moleculara:*

Izolarea ADN și ARN;

Amplificarea ADN/ARN

Electroforeza

Tehnici de detectare a mutațiilor:

ASO.

RFLP.

DGGE.

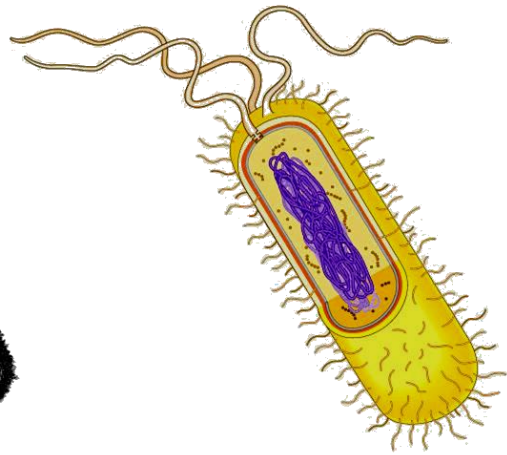
Real-Time PCR.

Secvențiere.

ADN și ARN non-self.

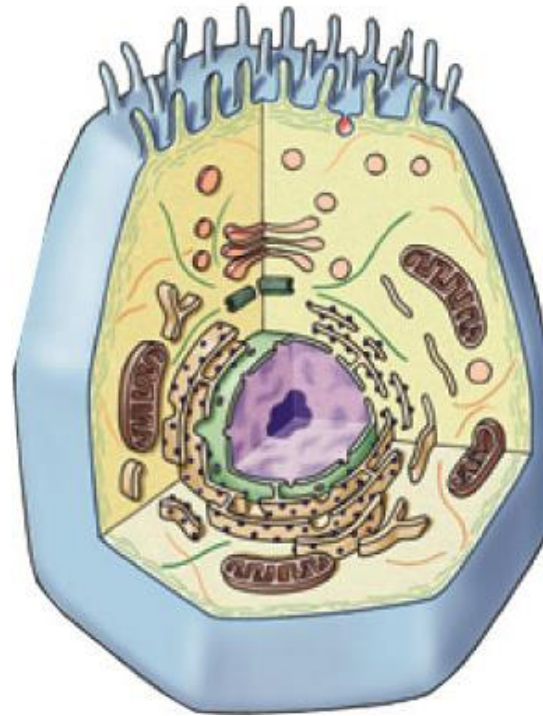
## **Tehnici de evaluare structurală și funcțională a organitelor celulare**

# Tipuri de celule



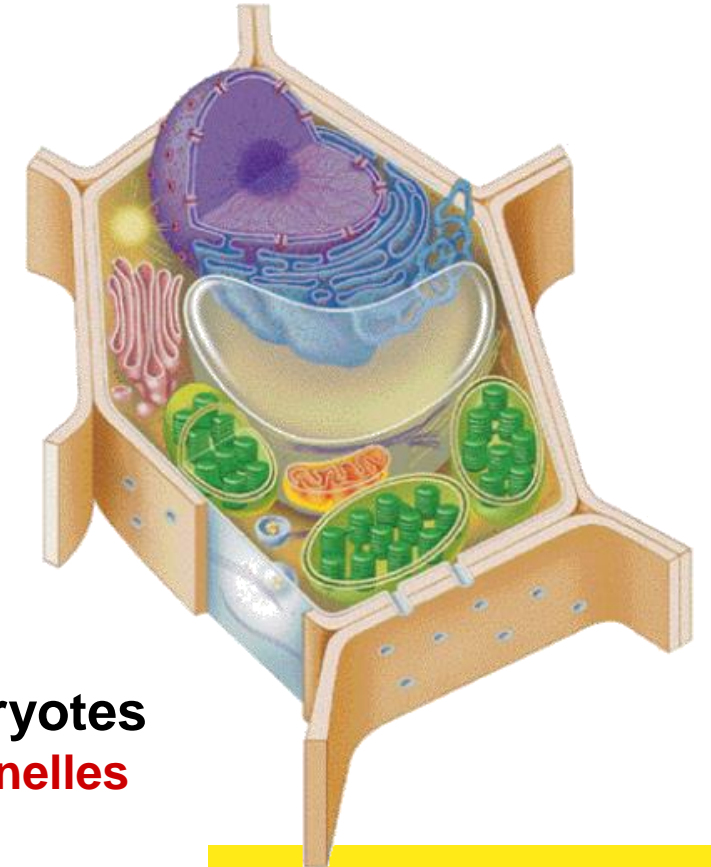
**bacteria  
cells**

**Prokaryote**  
**- no organelles**



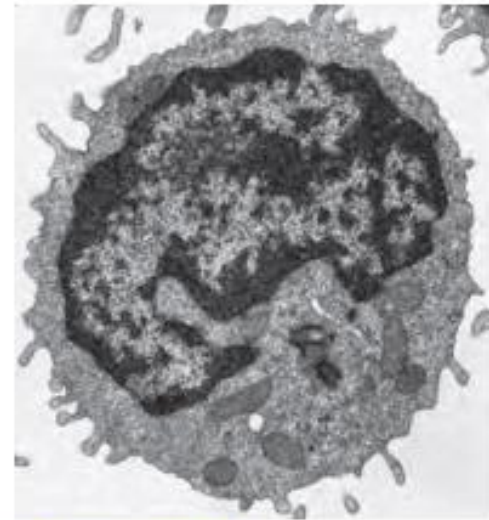
**animal cells**

**Eukaryotes**  
**- organelles**



**plant cells**

Funcția dictează structura, sau  
reciprocă?



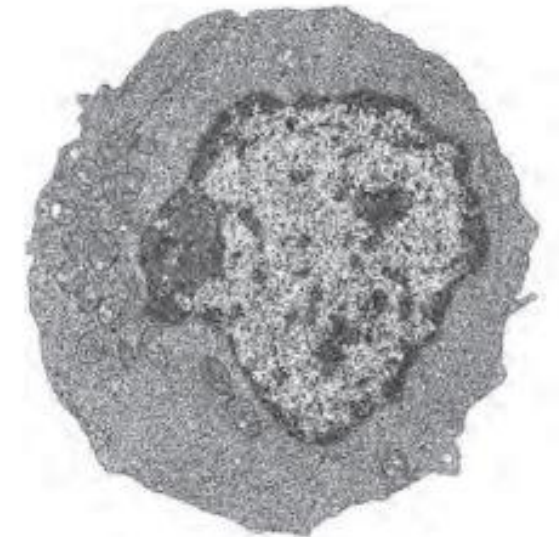
(A) resting T or B cell

1 μm



(B) effector B cell (plasma cell)

1 μm

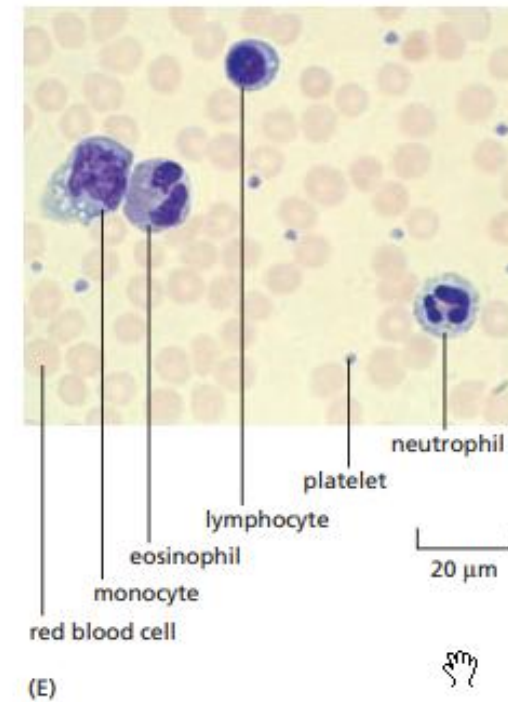
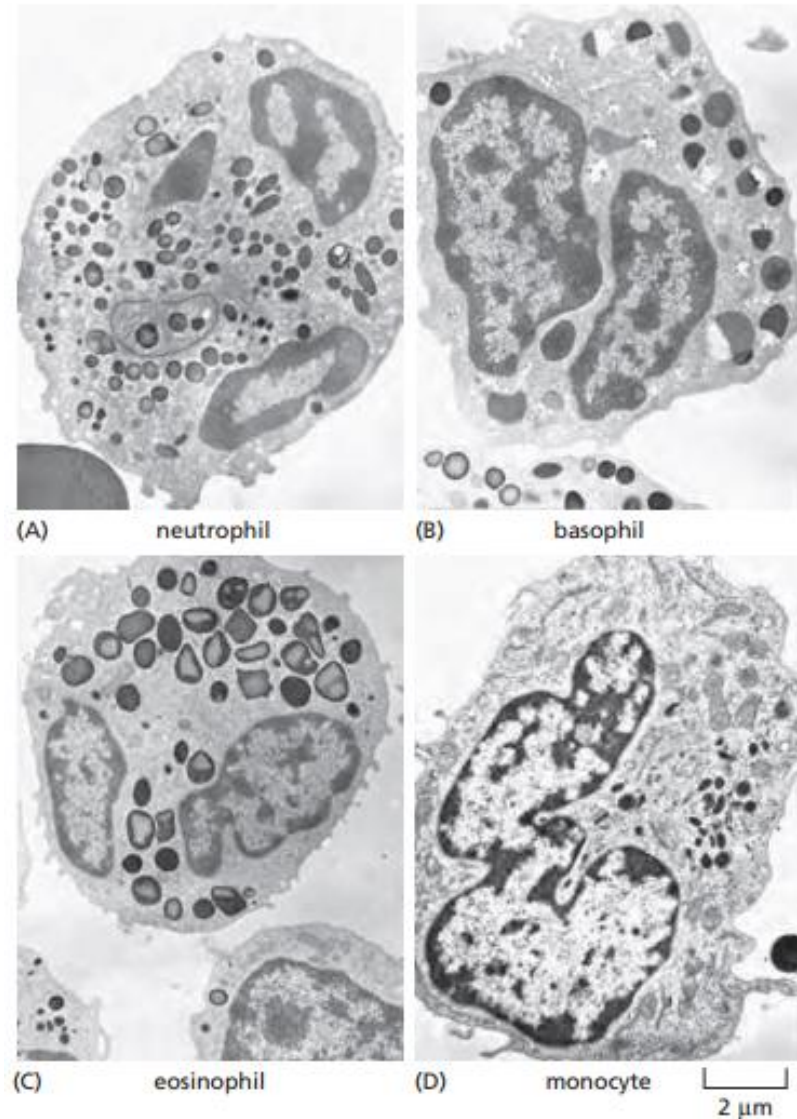


(C) effector T cell

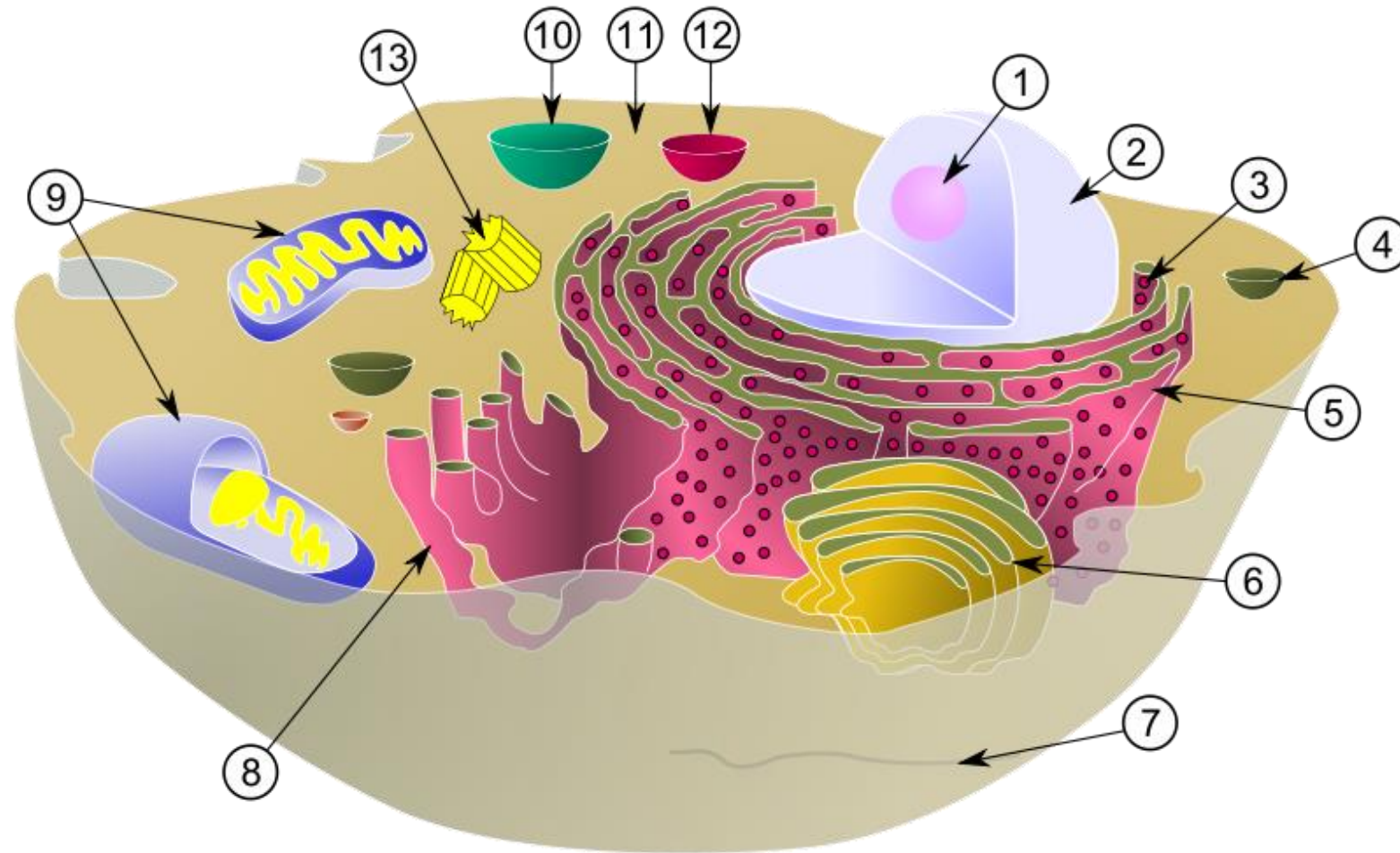
1 μm

Figure 24-14 Electron micrographs of resting and effector lymphocytes.

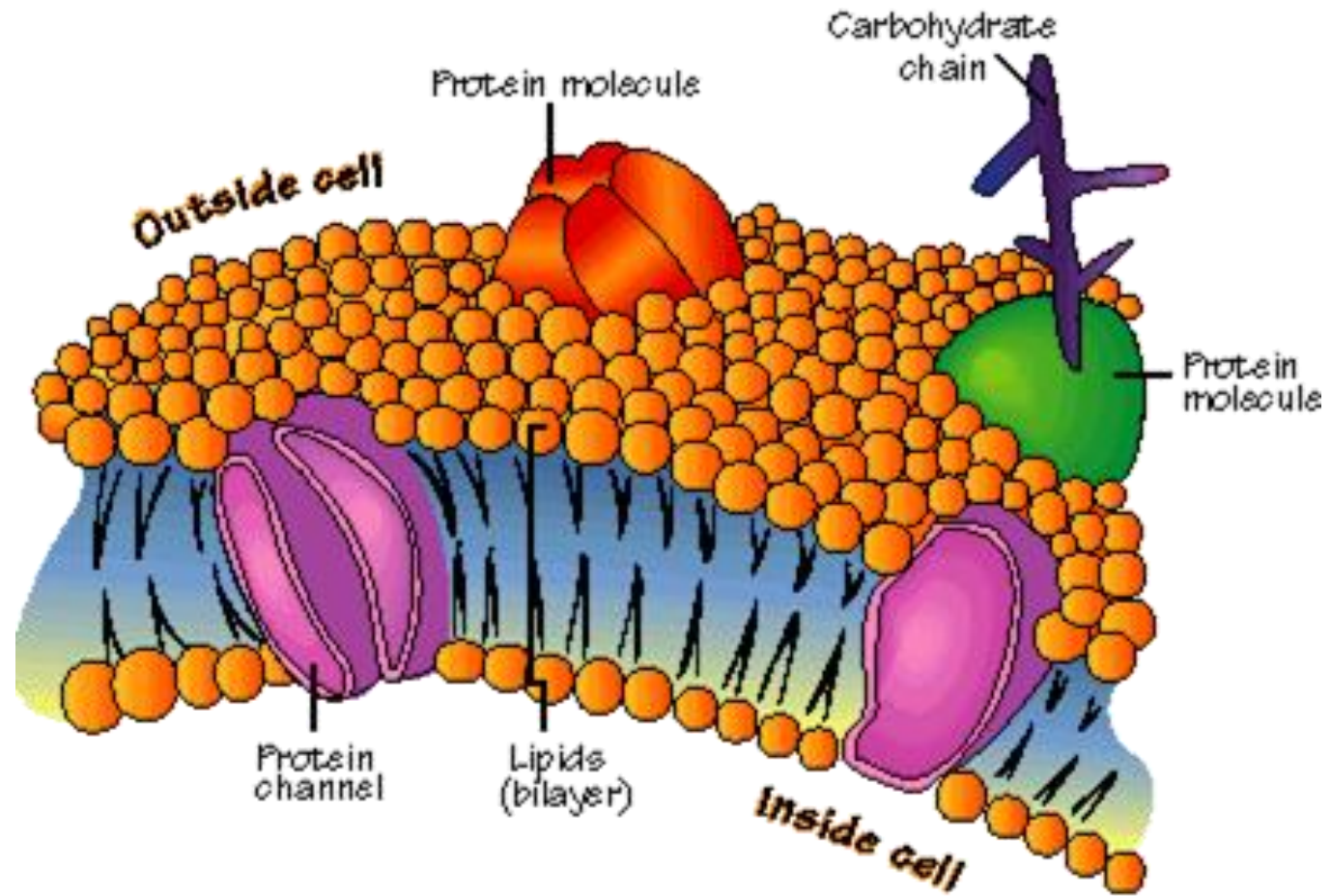
Funcția dictează structura, sau  
reciproca?



**Figure 22-27 White blood cells.** (A–D) These electron micrographs show (A) a neutrophil, (B) a basophil, (C) an eosinophil, and (D) a monocyte. Electron micrographs of lymphocytes are shown in Figure 24-14. Each of the cell types shown here has a different function, which is reflected in the distinctive types of secretory granules and lysosomes it contains. There is only one nucleus per cell, but it has an irregular lobed shape, and in (A), (B), and (C) the connections between the lobes are out of the plane of section. (E) A light micrograph of a blood smear stained with the Romanowsky stain, which colors the white blood cells strongly. (Courtesy of Dorothy Bainton.)

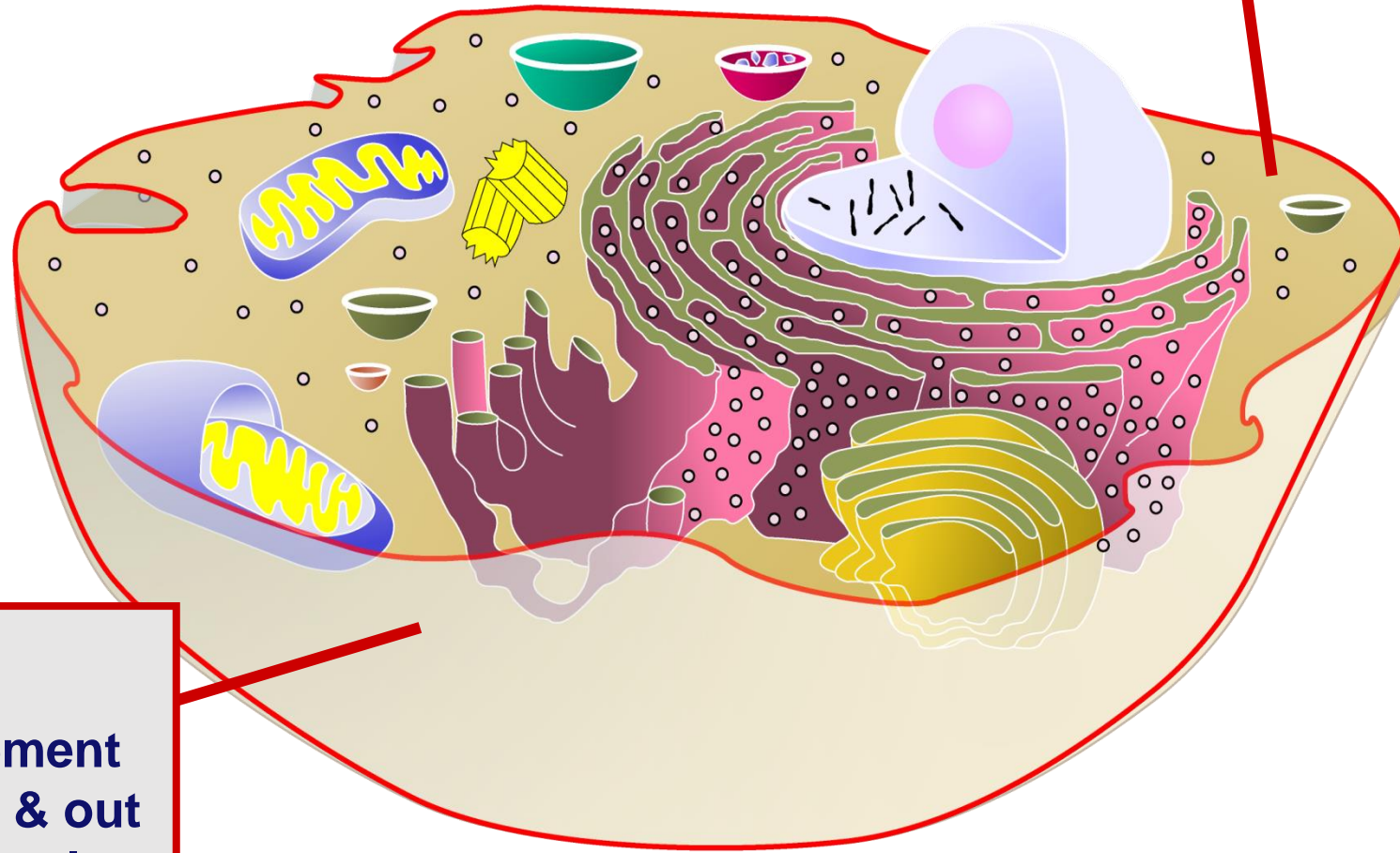


**Celula eucariotă. Organite celulare:** (1) nucleol (2) nucleu (3) ribozomi (4) vezicule, (5) reticul endoplasmatic rugos, (6) aparatul Golgi, (7) citoschelet, (8) reticul endoplasmatic neted, (9) mitocondrie, (10) vacuole, (11) citoplasmă, (12) lizozom, (13) centriol.



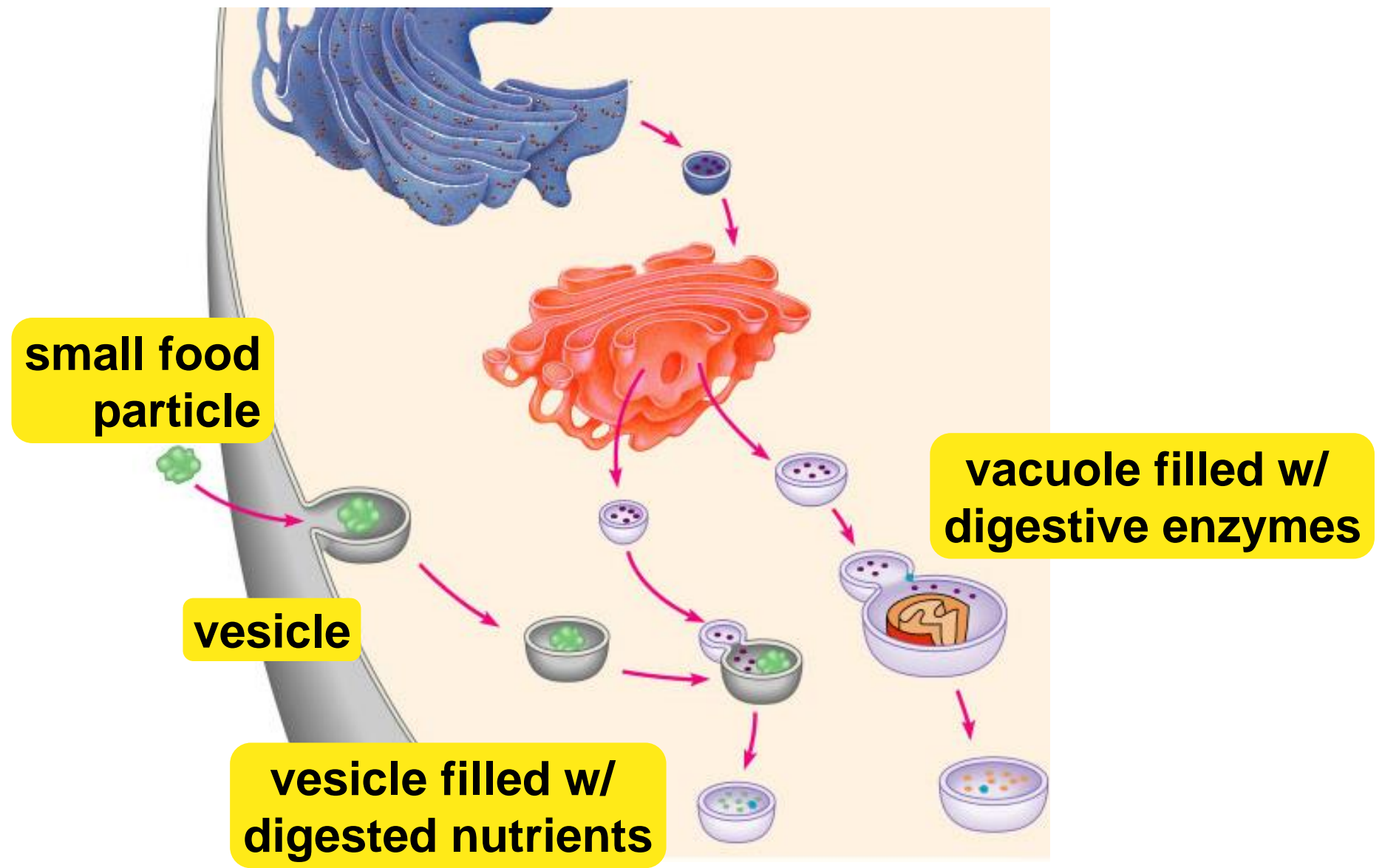


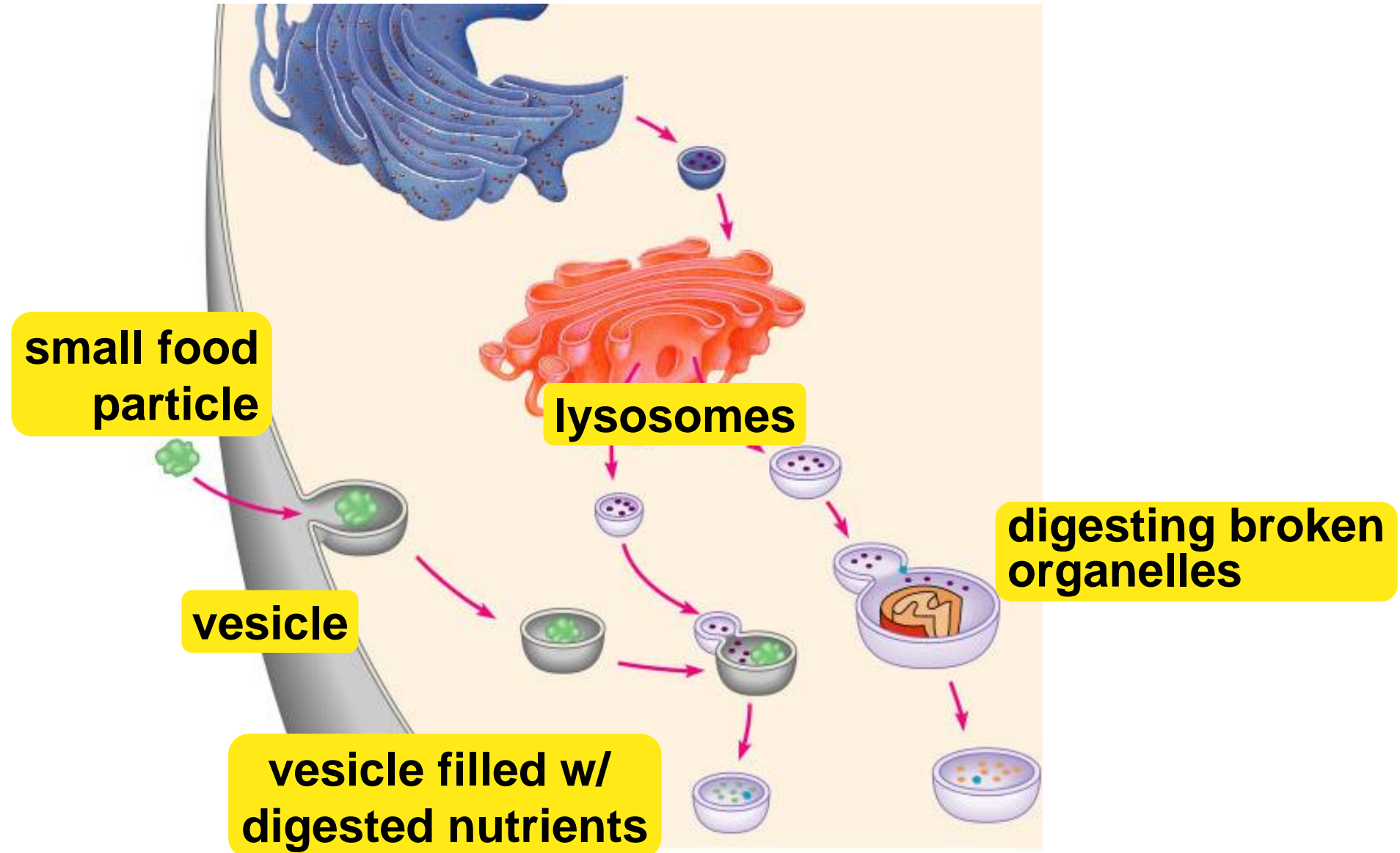
**cytoplasm**  
▪jelly-like material holding  
organelles in place

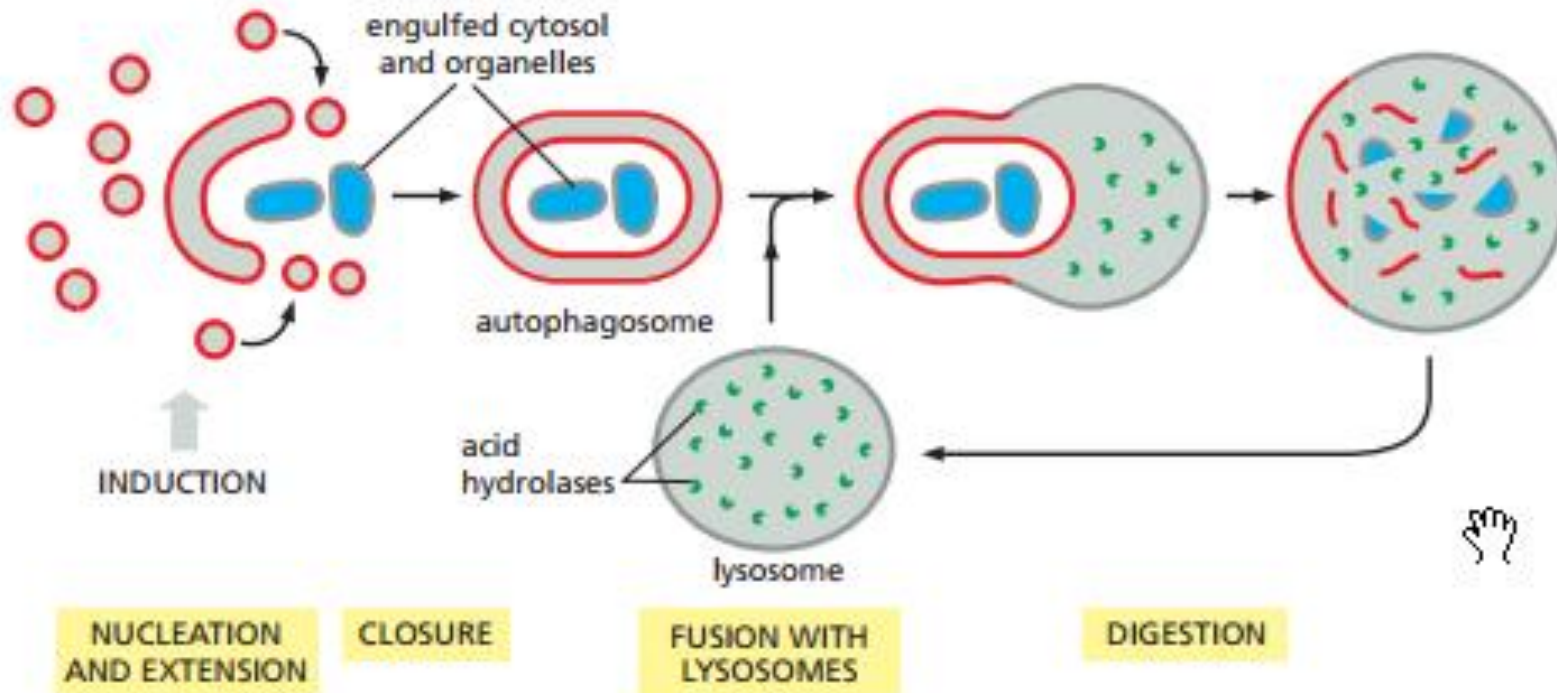


**cell membrane**  
▪cell boundary  
▪controls movement  
of materials in & out  
▪recognizes signals

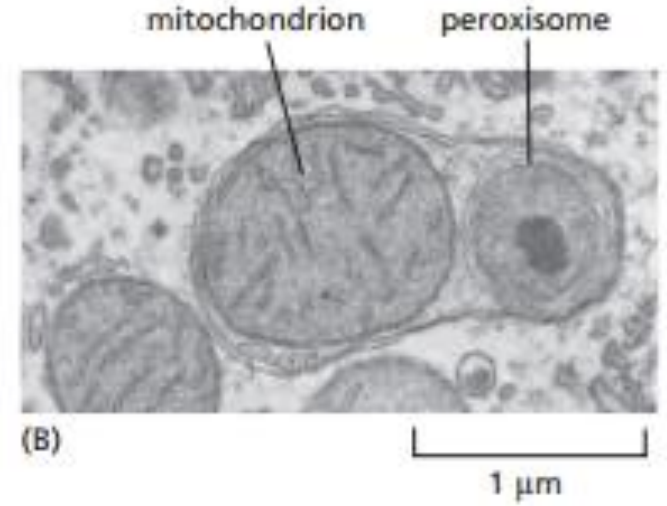








(A)



(B)

**Figure 13-43 A model of autophagy.** (A) Activation of a signaling pathway initiates a nucleation event in the cytoplasm. A crescent of autophagosomal membrane grows by fusion of vesicles



**vacuole & vesicles**

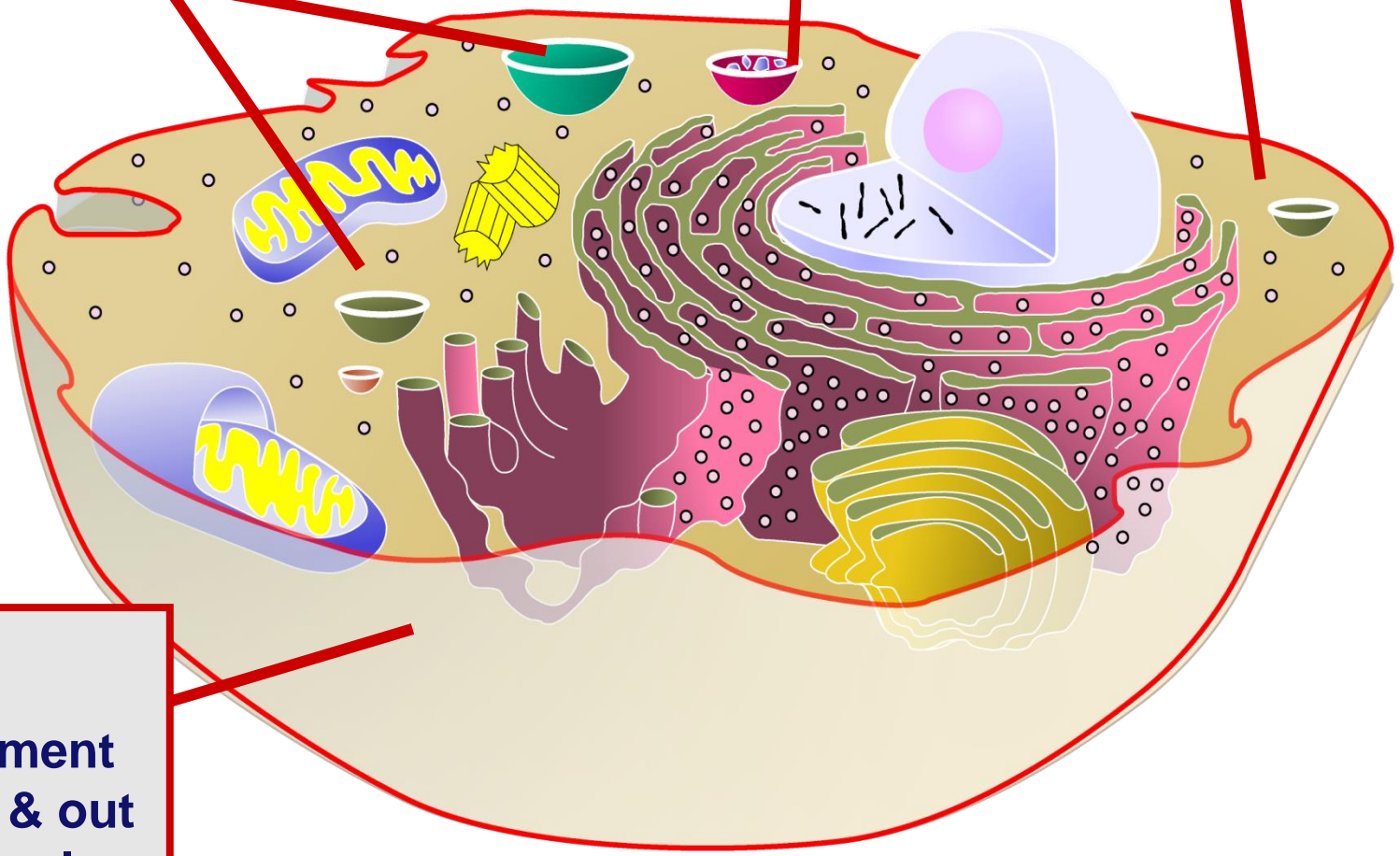
- transport inside cells
- storage

**lysosome**

- food digestion
- garbage disposal & recycling

**cytoplasm**

- jelly-like material holding organelles in place

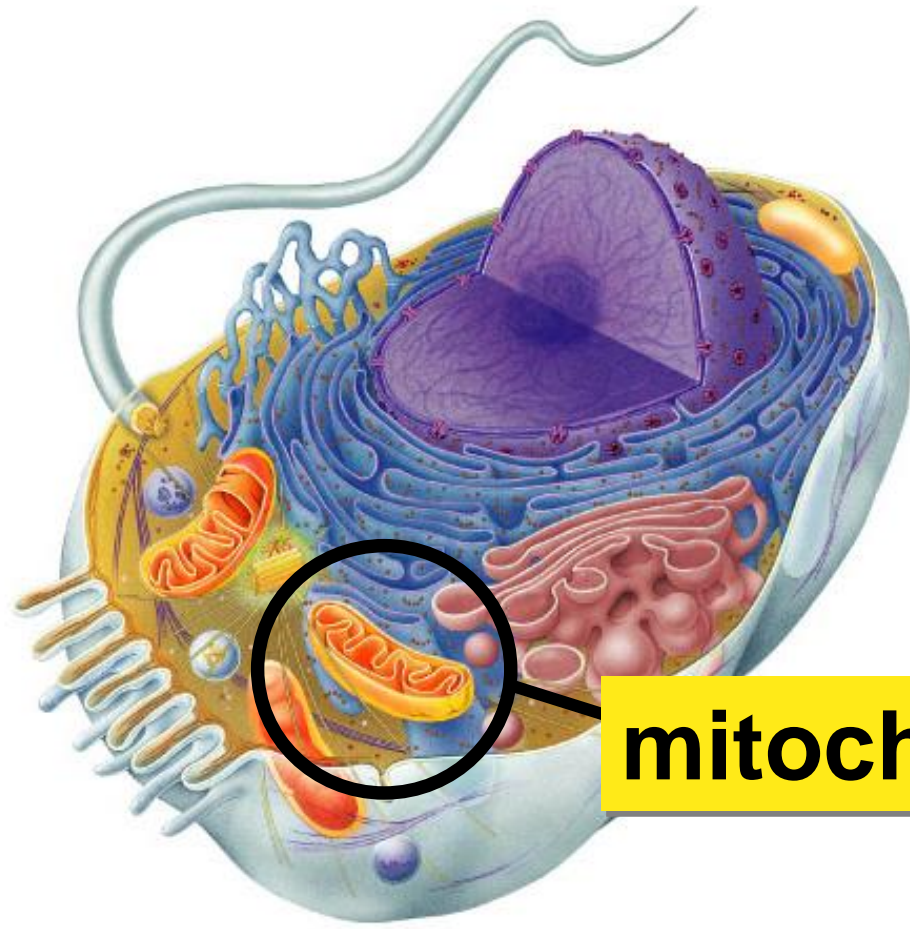


**cell membrane**

- cell boundary
- controls movement of materials in & out
- recognizes signals

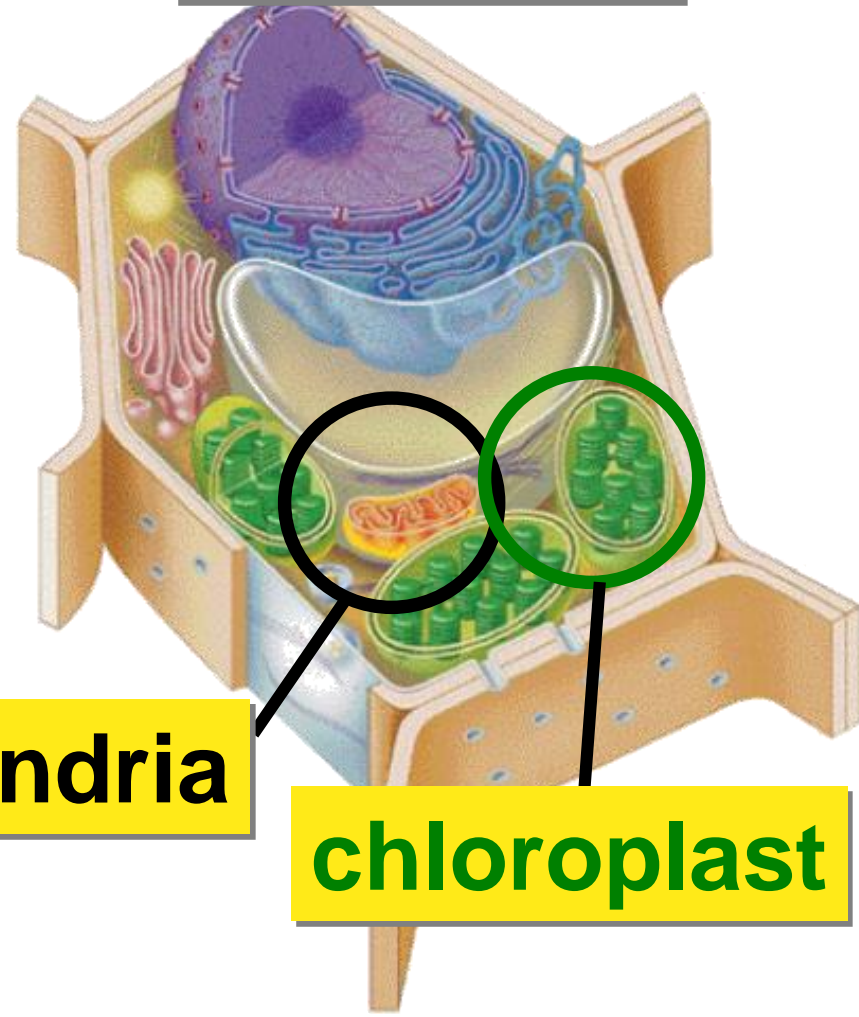


# animal cells

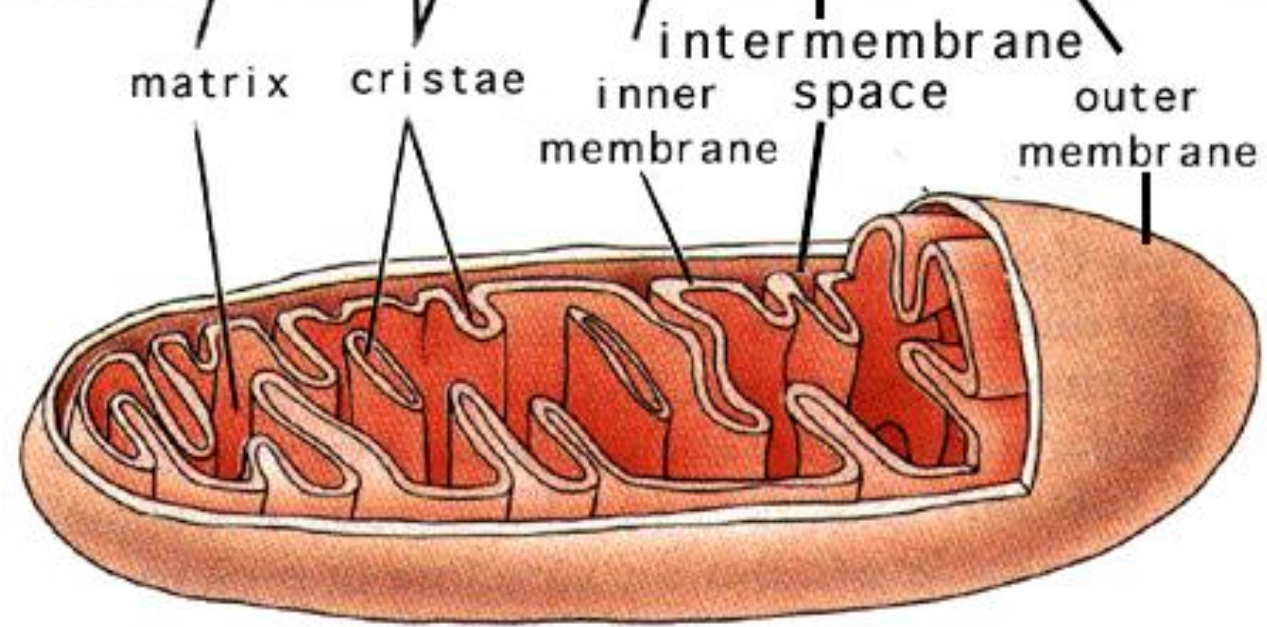
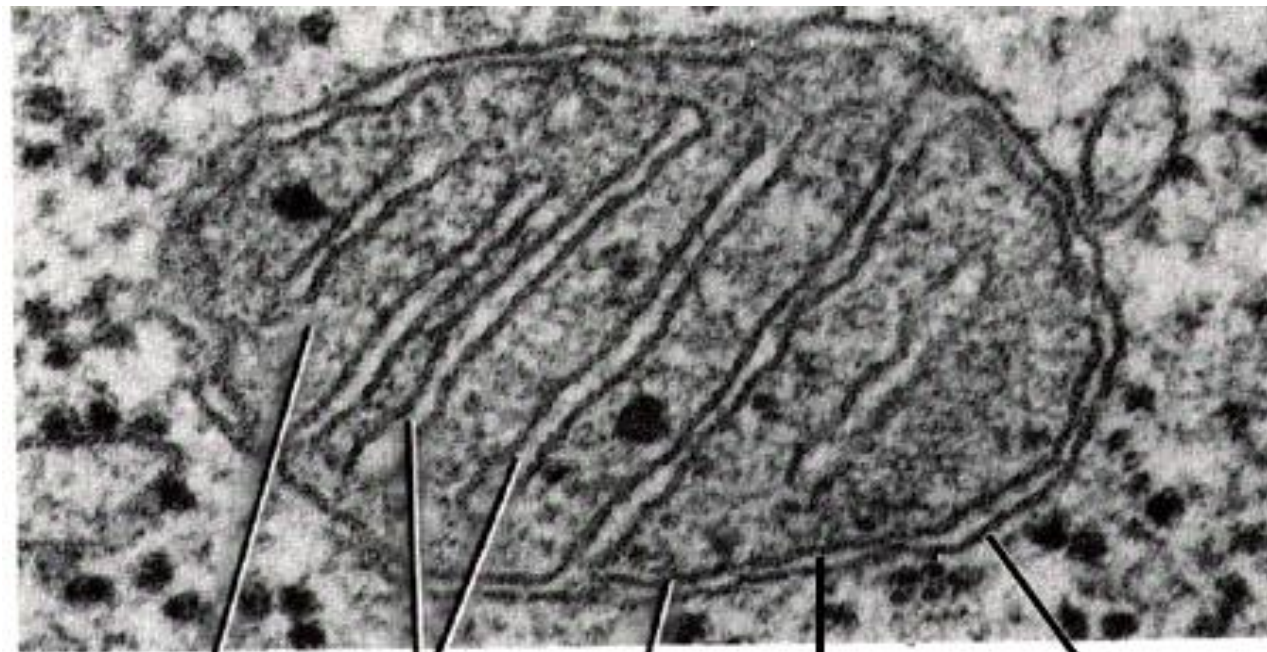


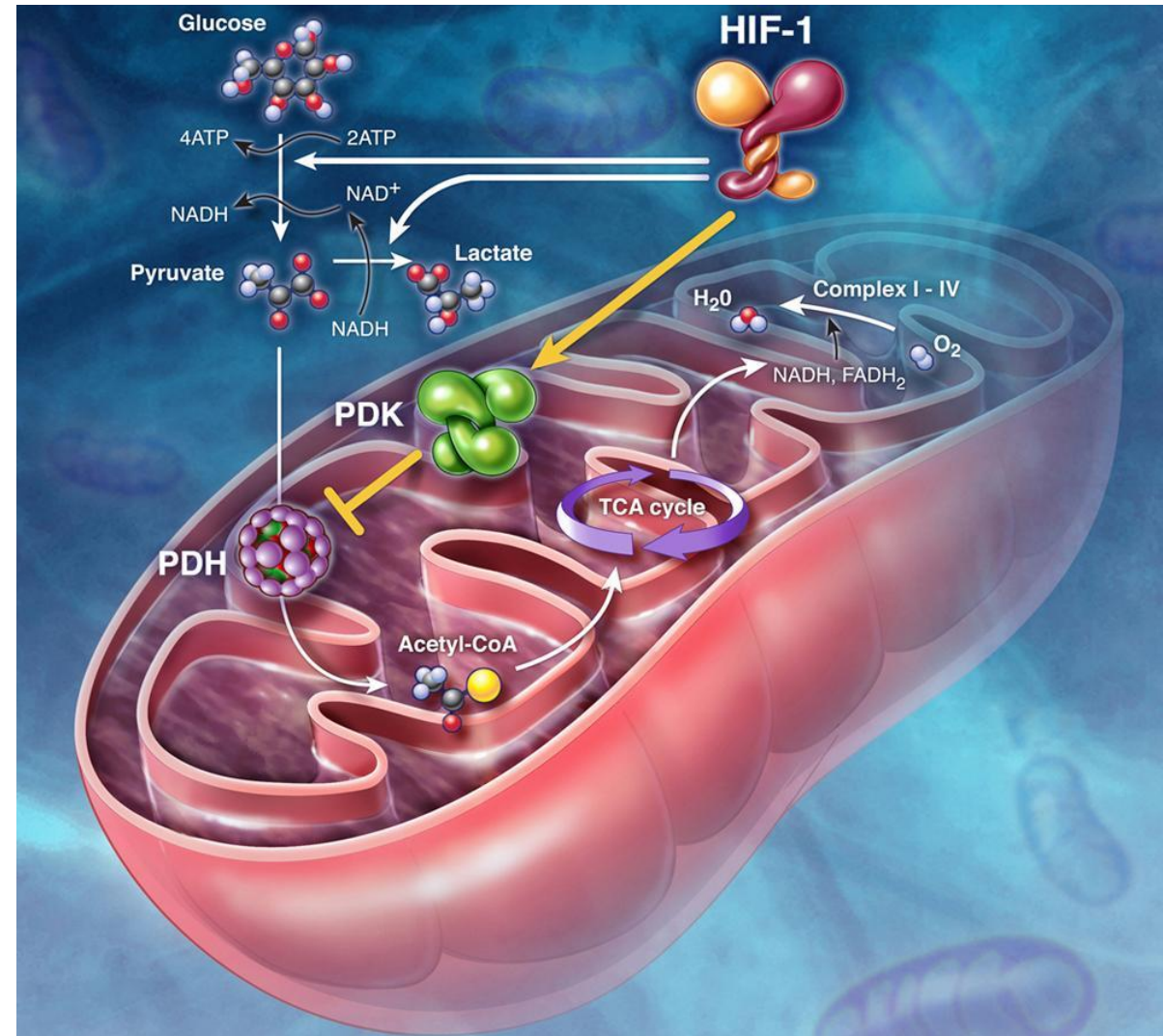
**mitochondria**

# plant cells



**chloroplast**







Don Fawcett-Keith Porter/Photo Researchers, Inc.





**vacuole & vesicles**

- transport inside cells
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**lysosome**

- food digestion
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**cytoplasm**

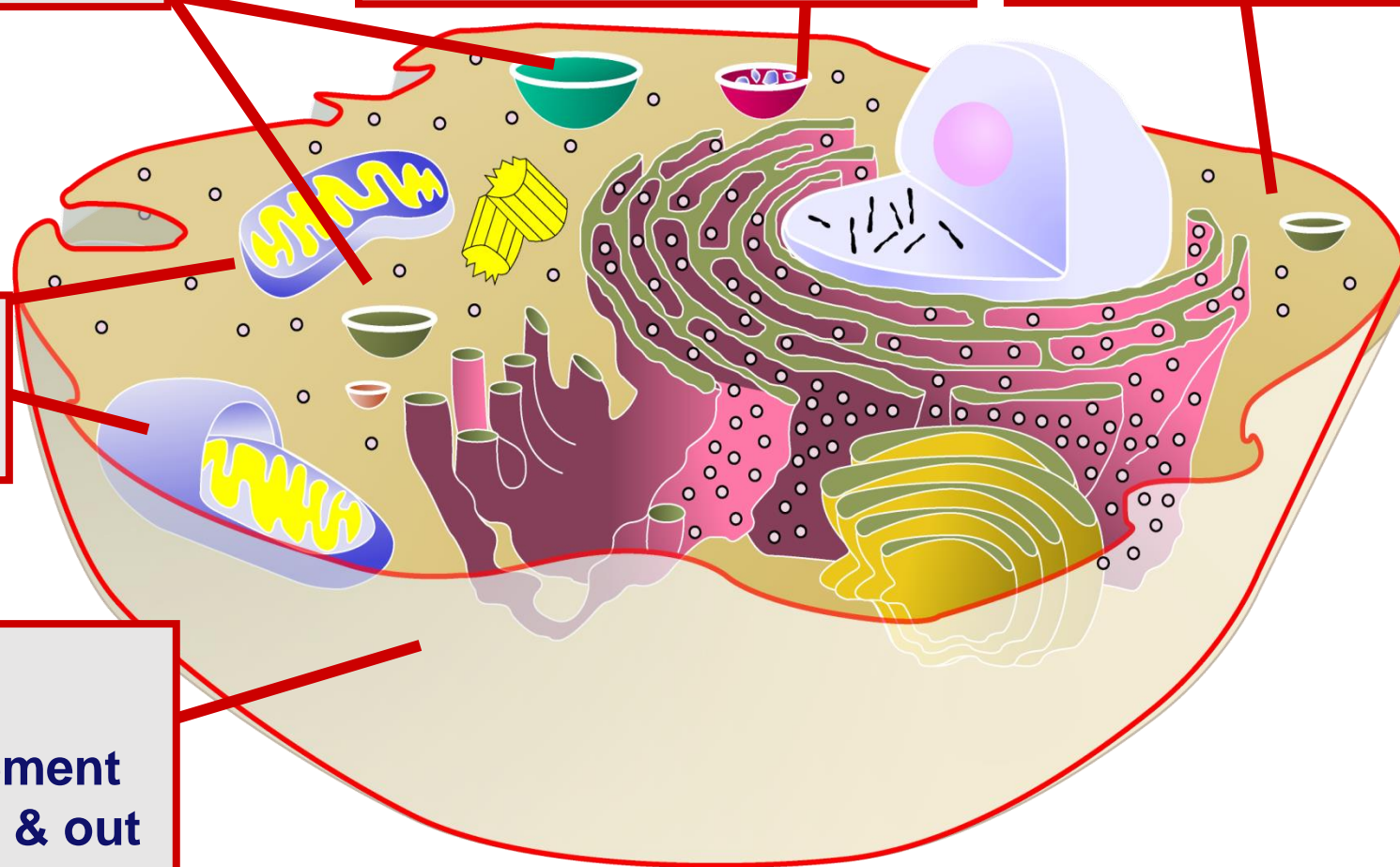
- jelly-like material holding organelles in place

**mitochondria**

- make ATP energy from sugar + O<sub>2</sub>

**cell membrane**

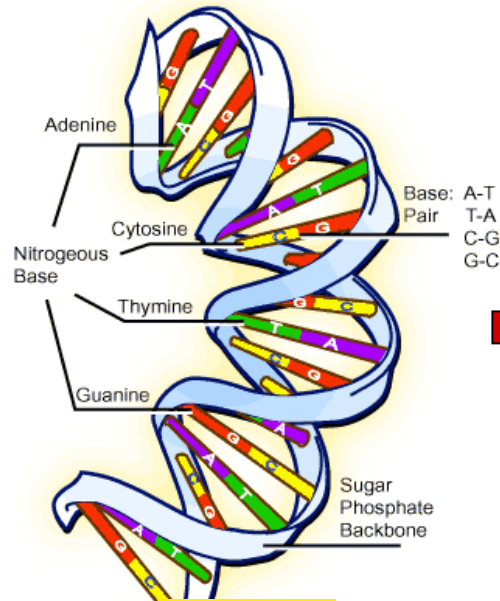
- cell boundary
- controls movement of materials in & out
- recognizes signals



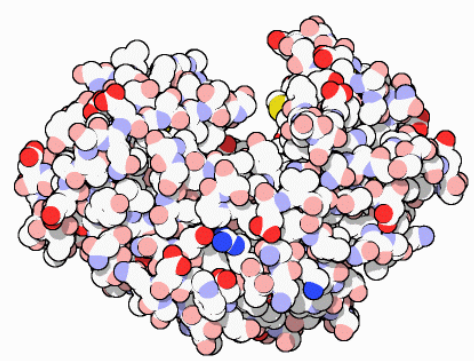


# one of the major job of cells is to make proteins, because...

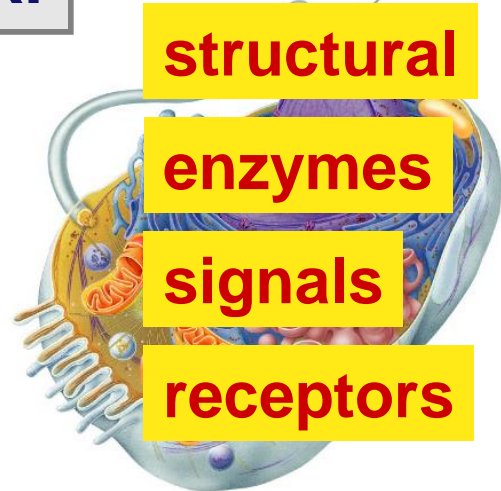
**proteins do all the work!**



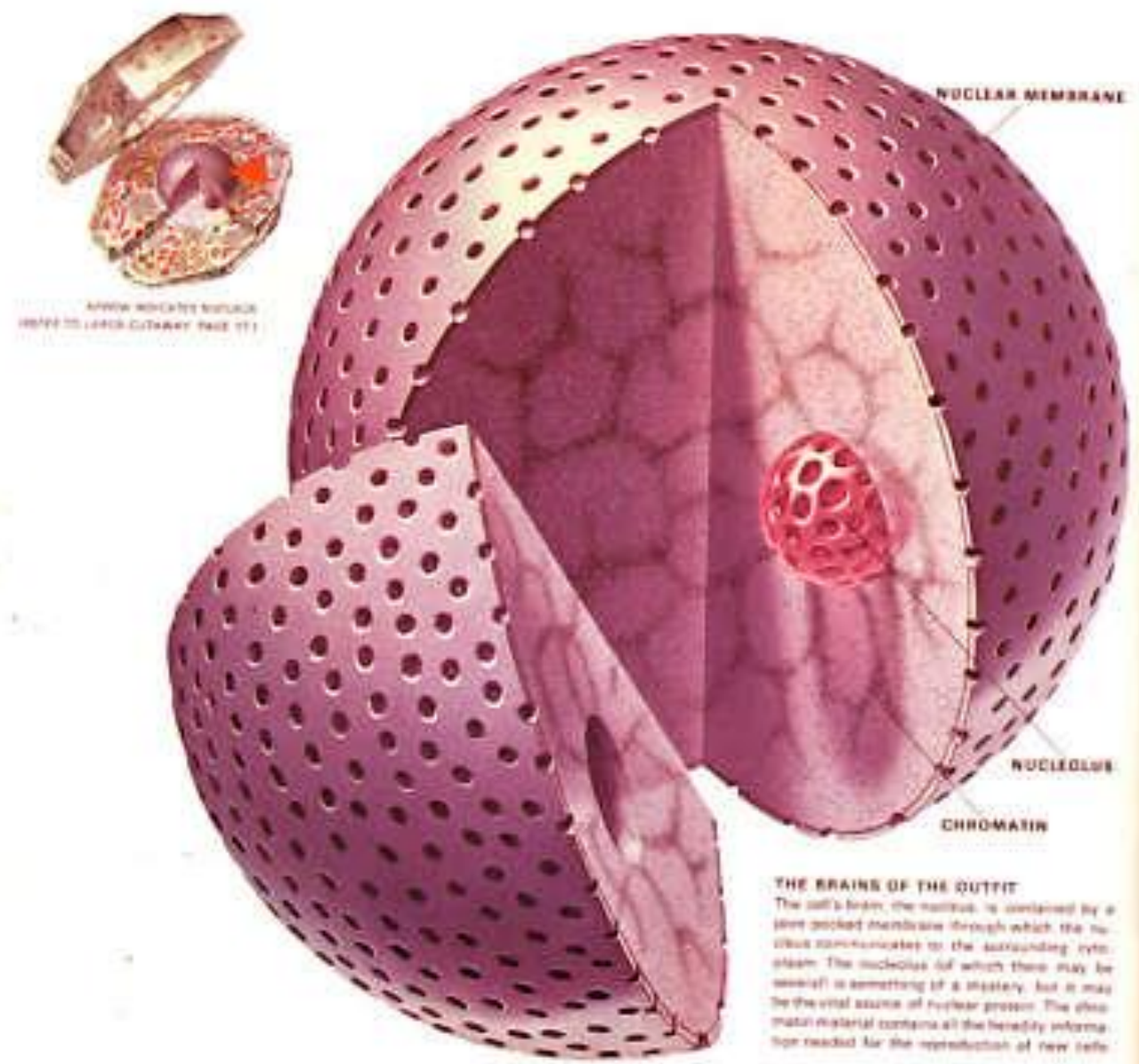
**DNA**



**proteins**



**cells**





**vacuole & vesicles**

- transport inside cells
- storage

**lysosome**

- food digestion
- garbage disposal & recycling

**cytoplasm**

- jelly-like material holding organelles in place

**nucleolus**

- produces ribosomes

**mitochondria**

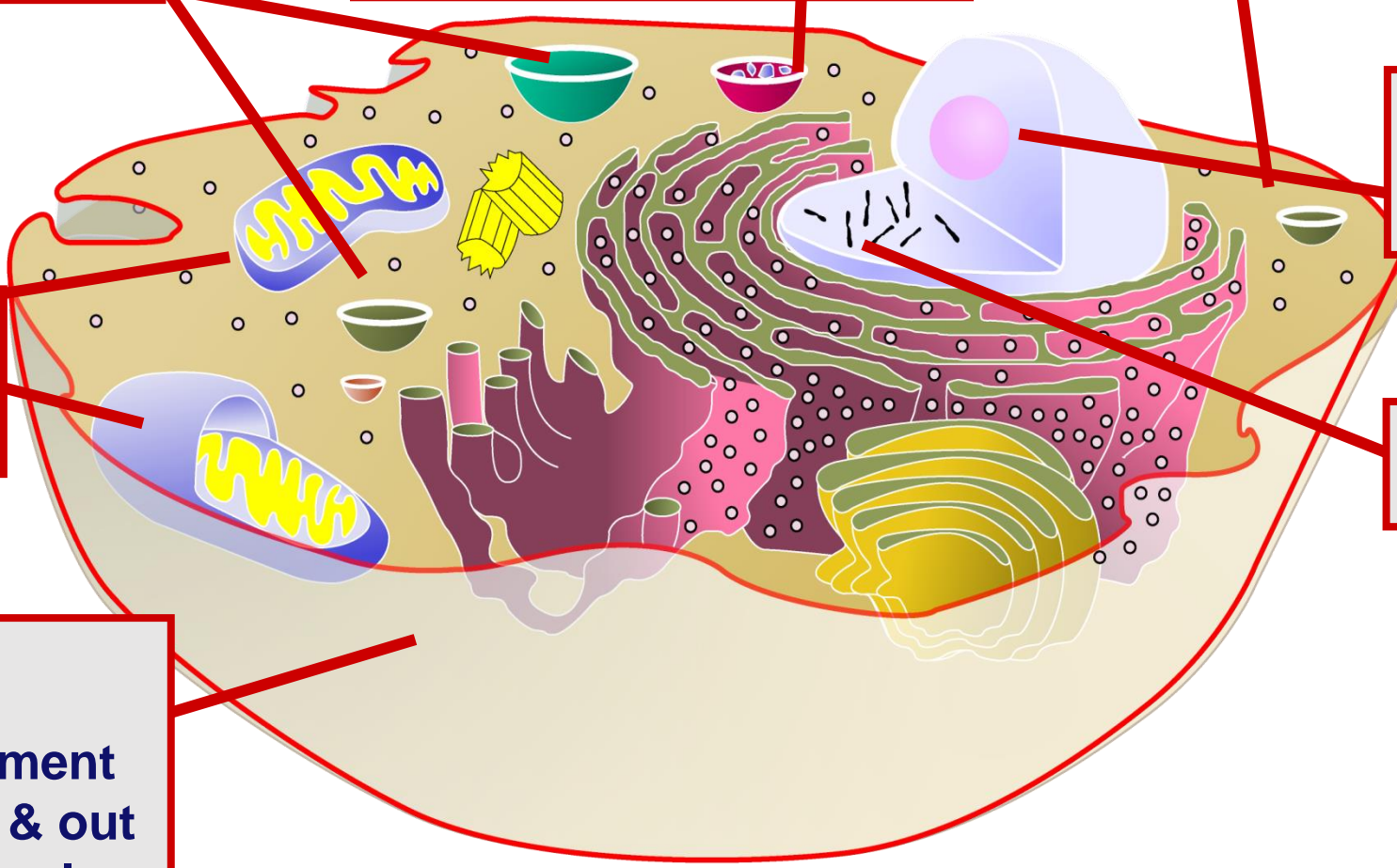
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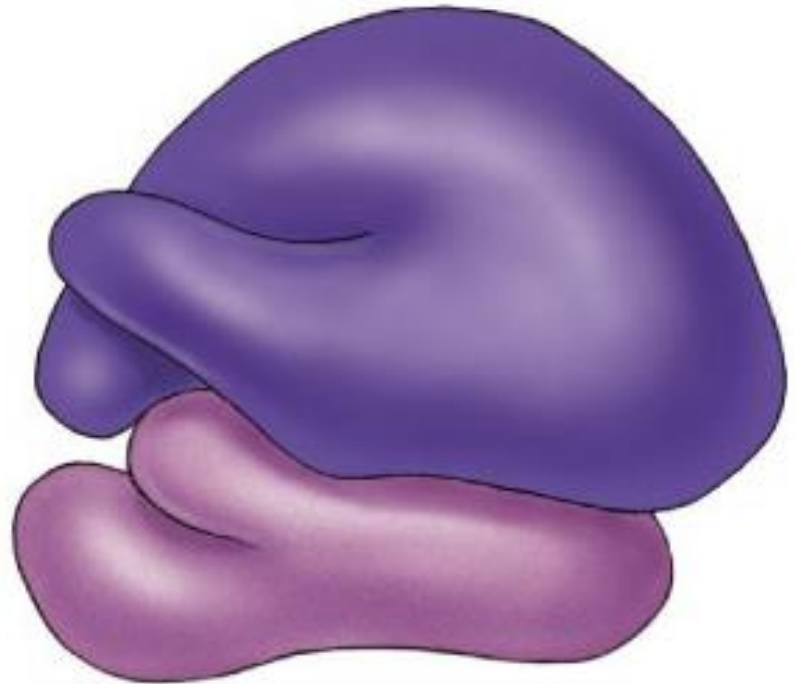
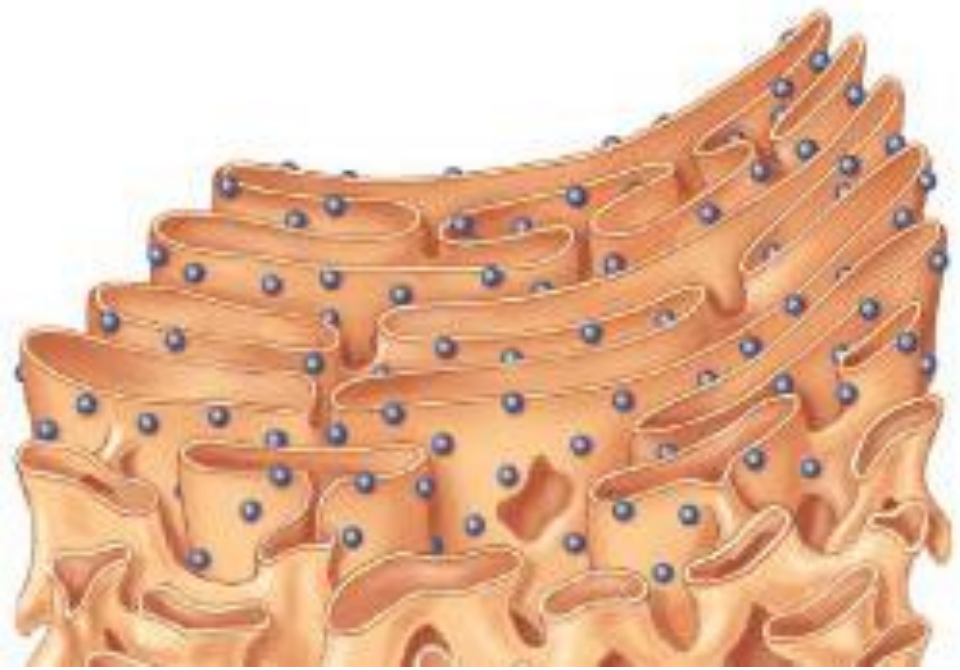
**chromosomes**

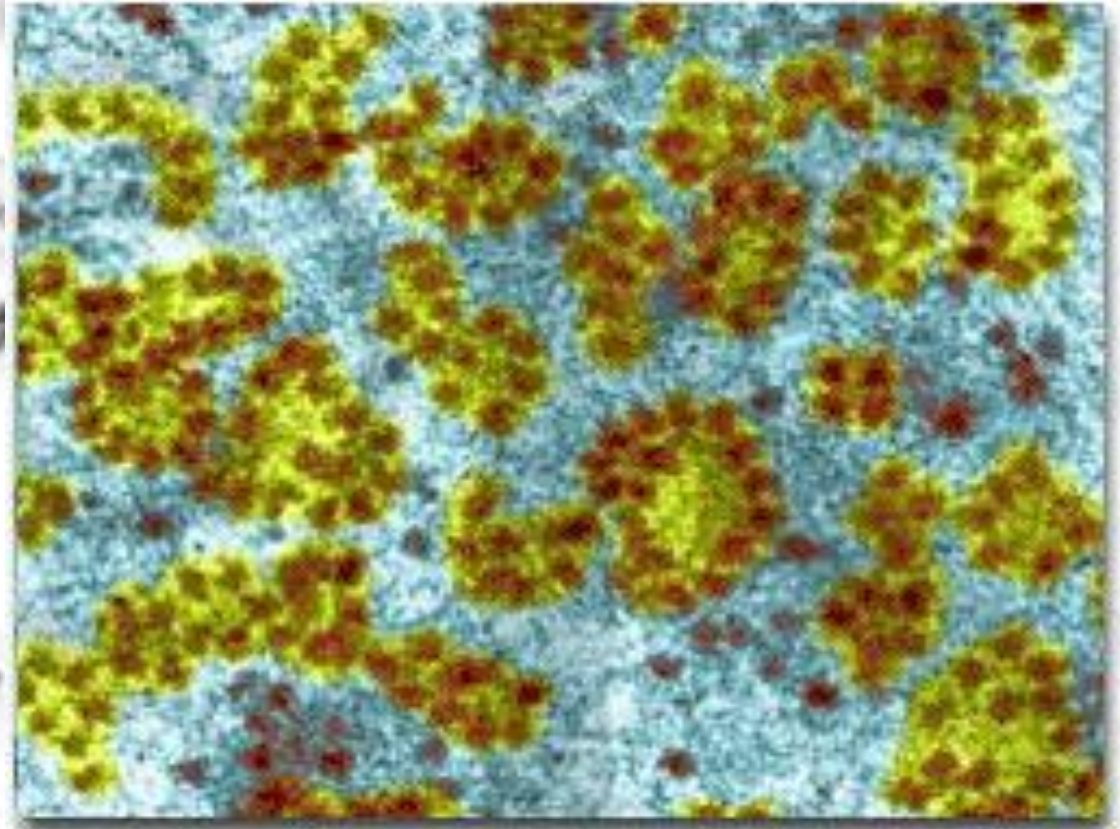
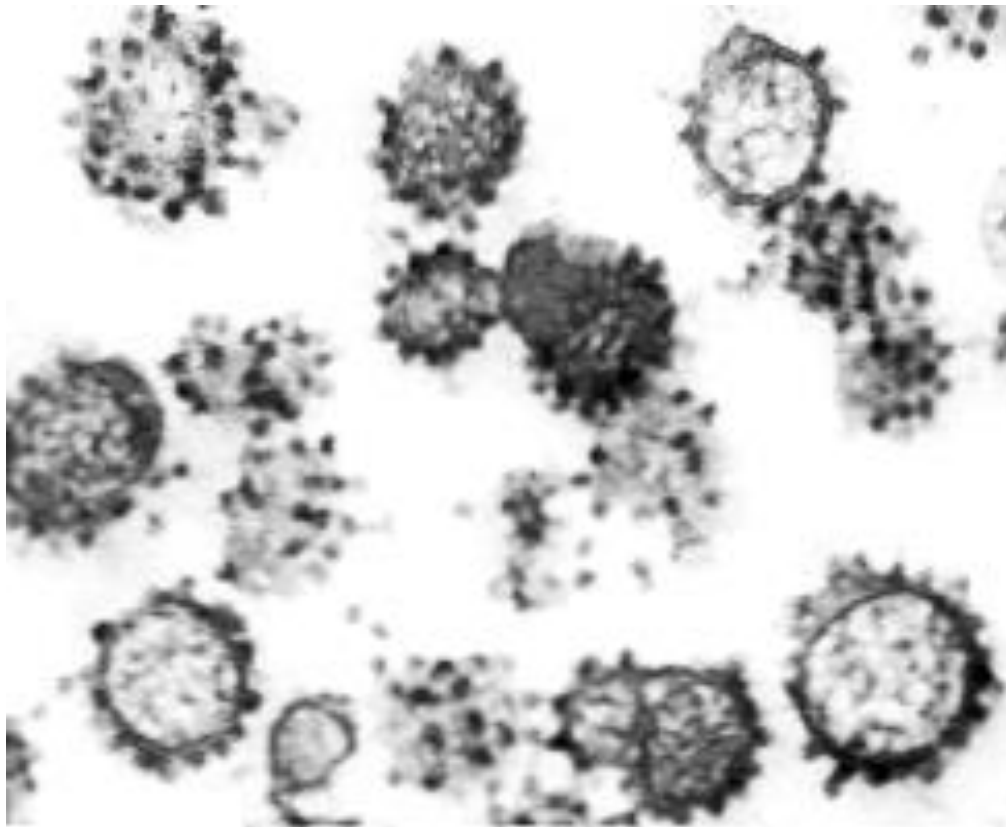
- DNA

**cell membrane**

- cell boundary
- controls movement of materials in & out
- recognizes signals









**vacuole & vesicles**

- transport inside cells
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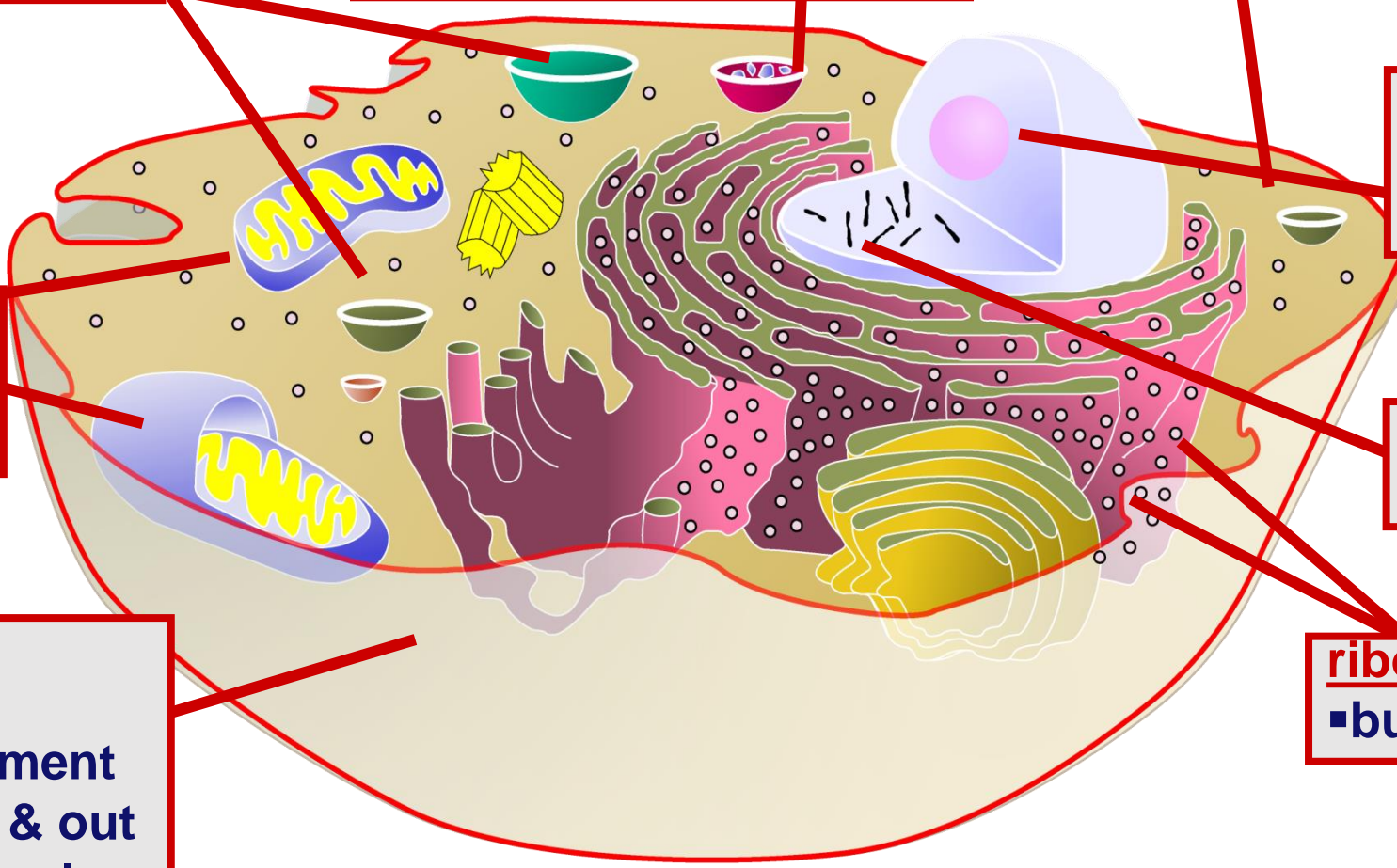
- DNA

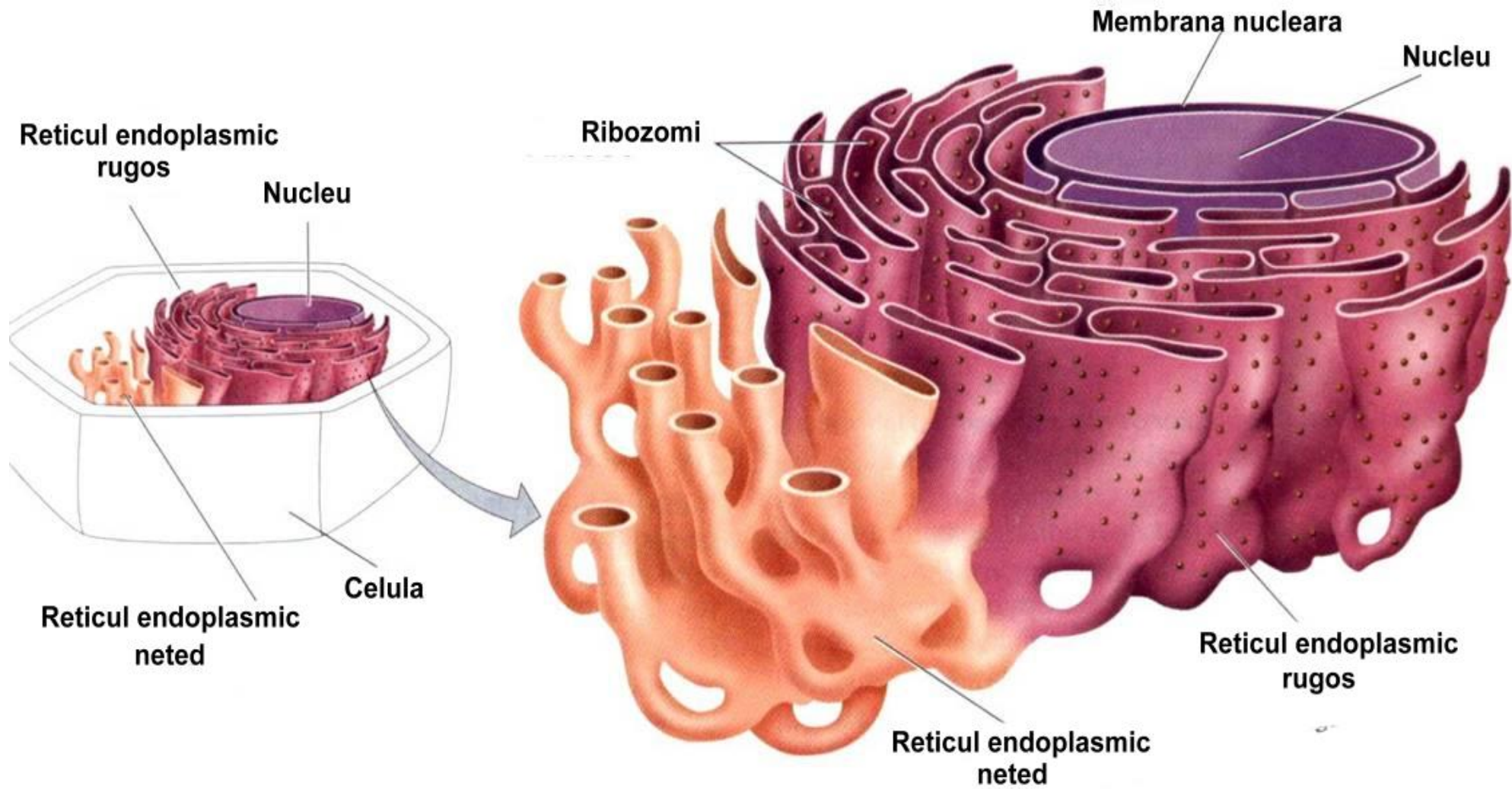
**ribosomes**

- build proteins

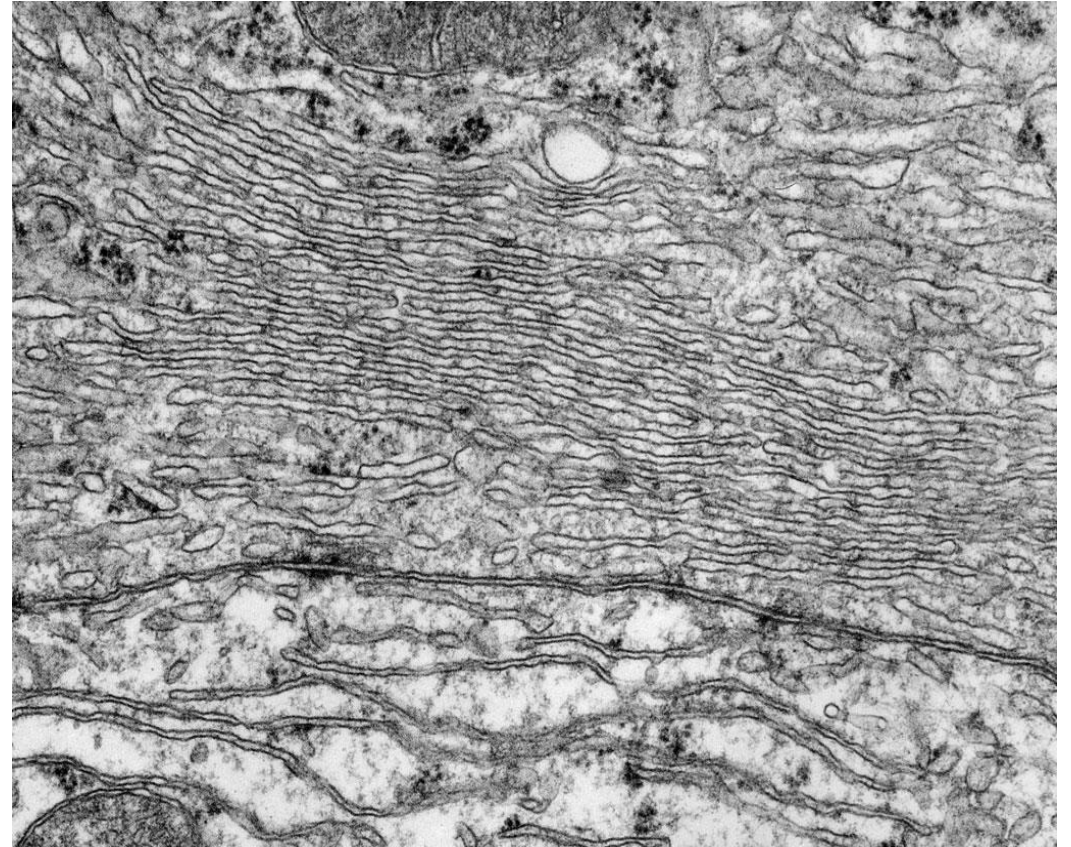
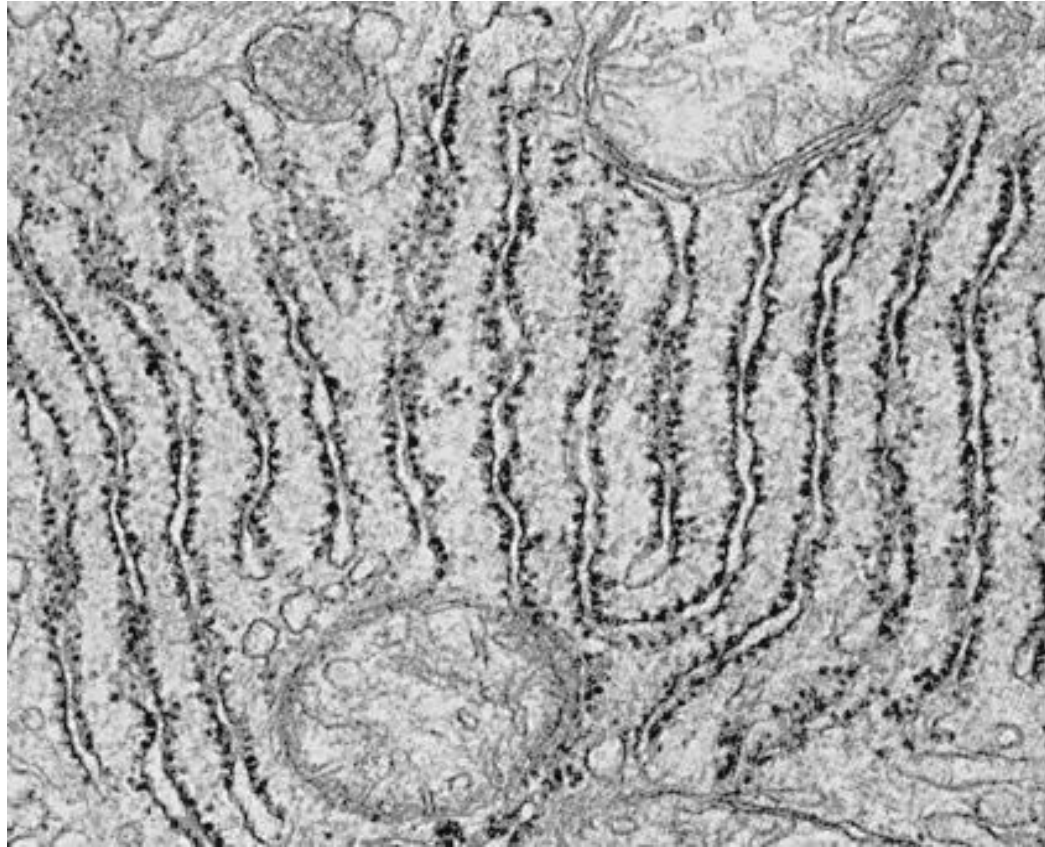
**cell membrane**

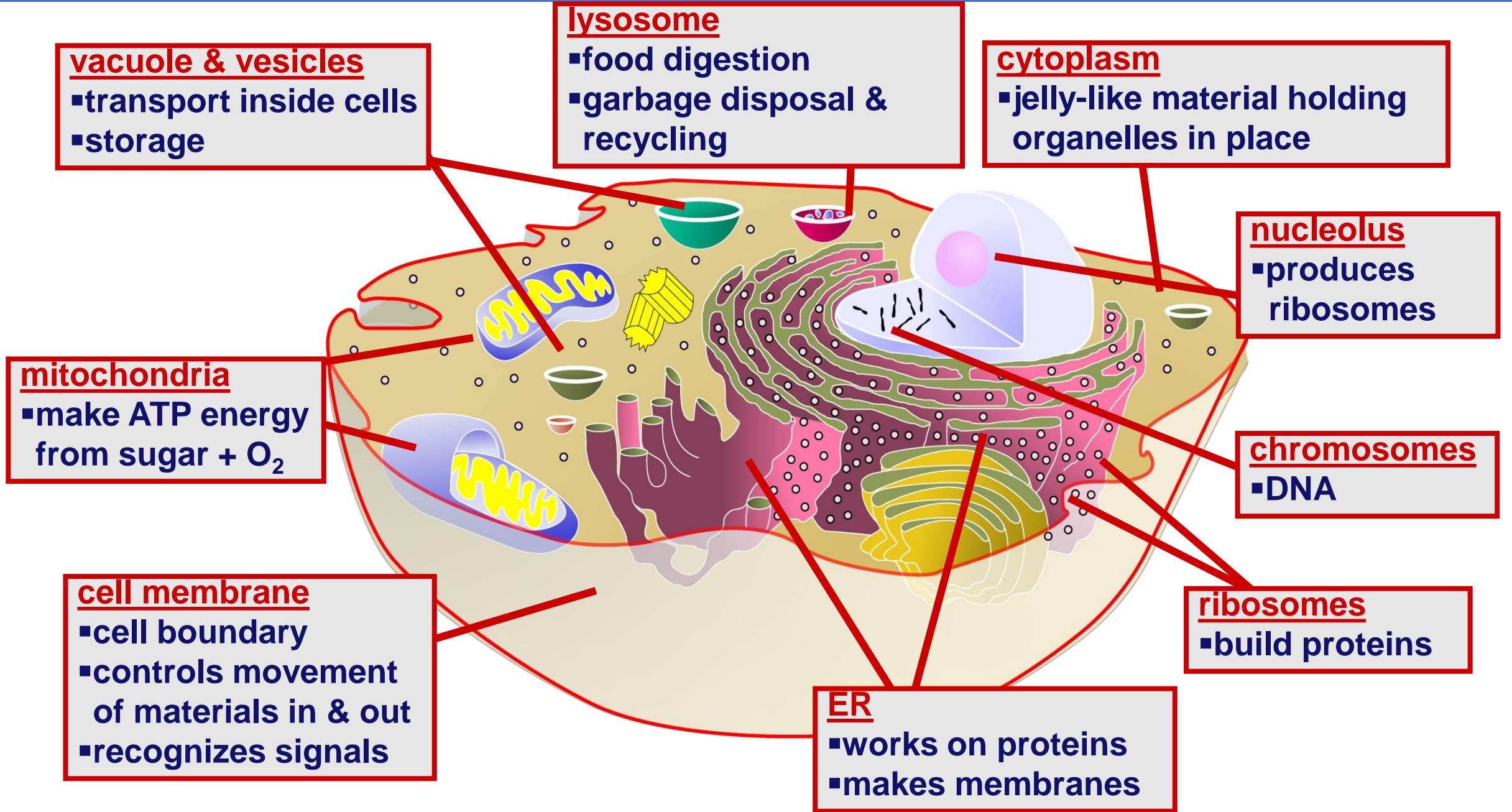
- cell boundary
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**vacuole & vesicles**

- transport inside cells
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- jelly-like material holding organelles in place

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- produces ribosomes

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- make ATP energy from sugar + O<sub>2</sub>

**chromosomes**

- DNA

**cell membrane**

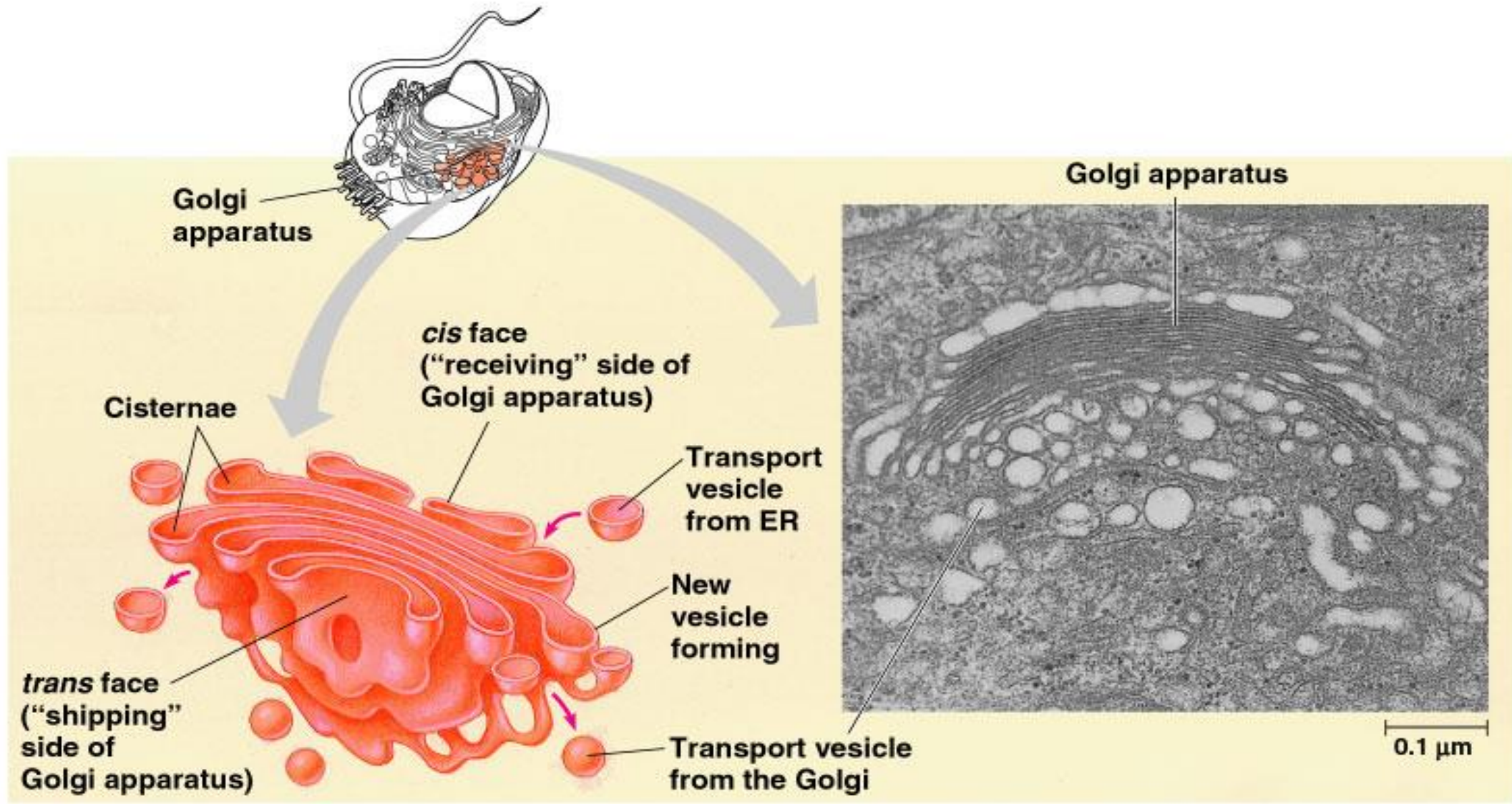
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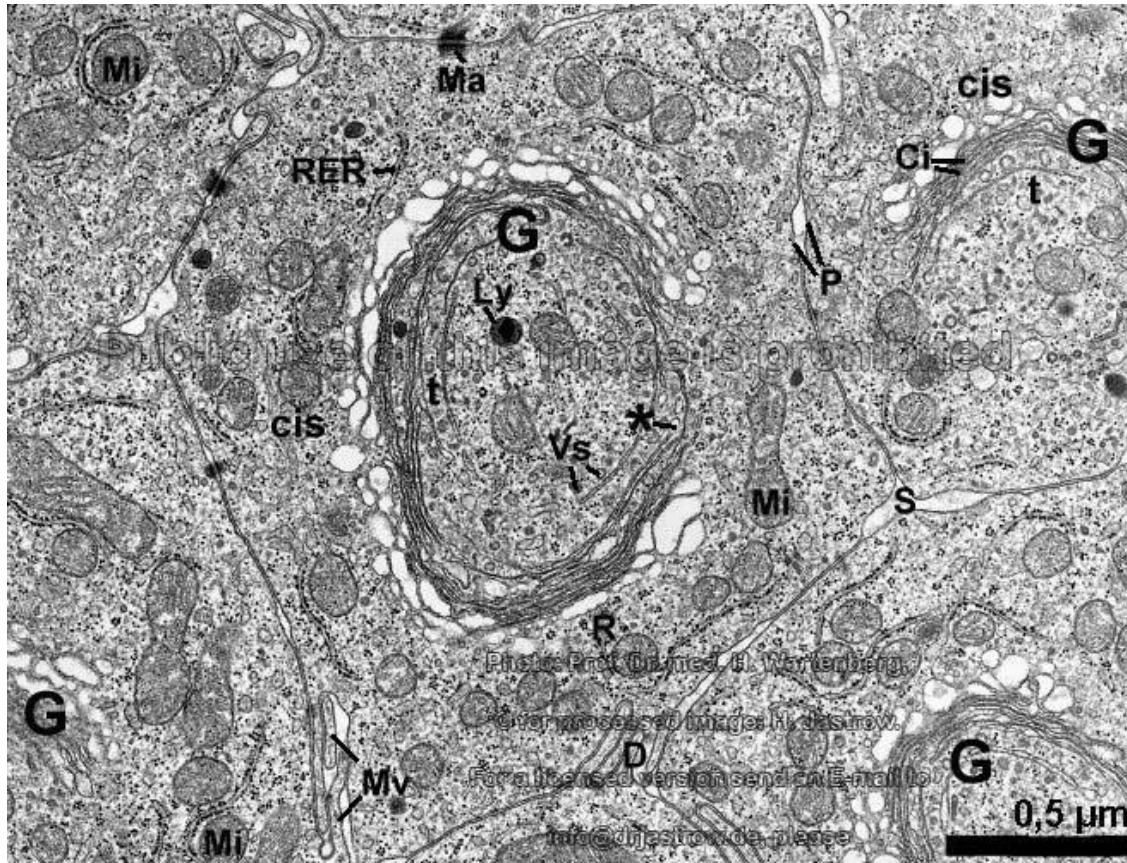
**ribosomes**

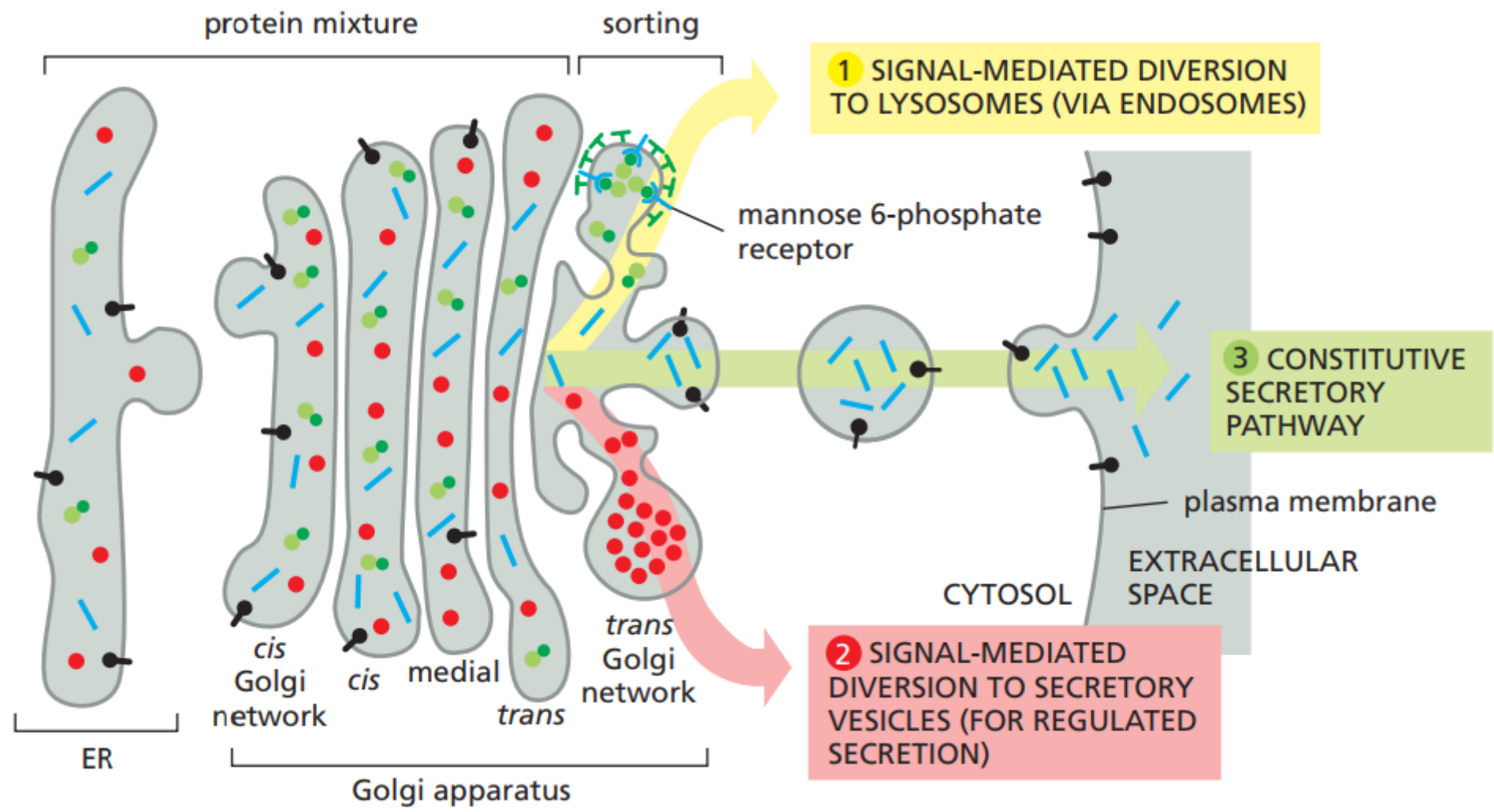
- build proteins

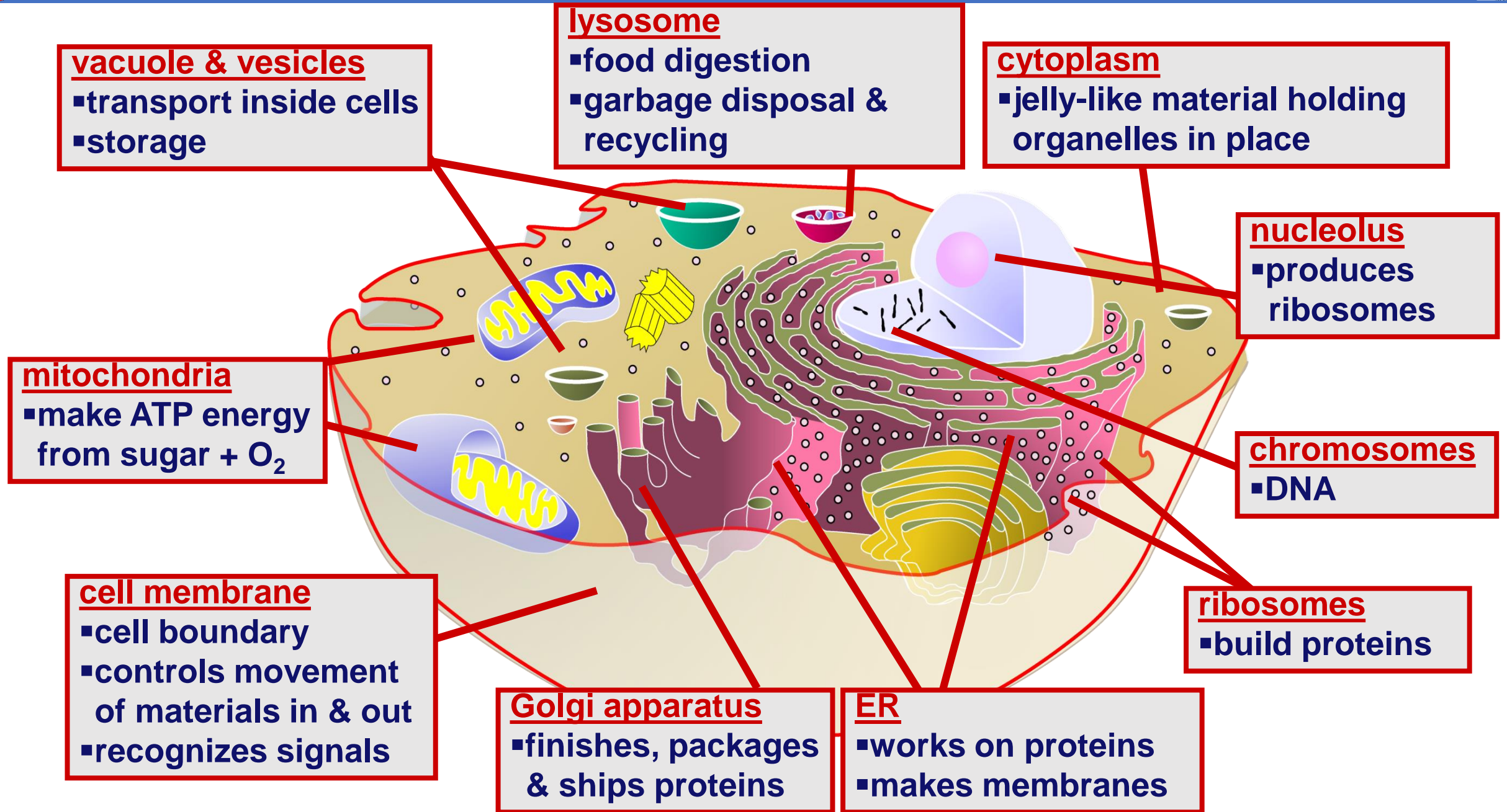
**ER**

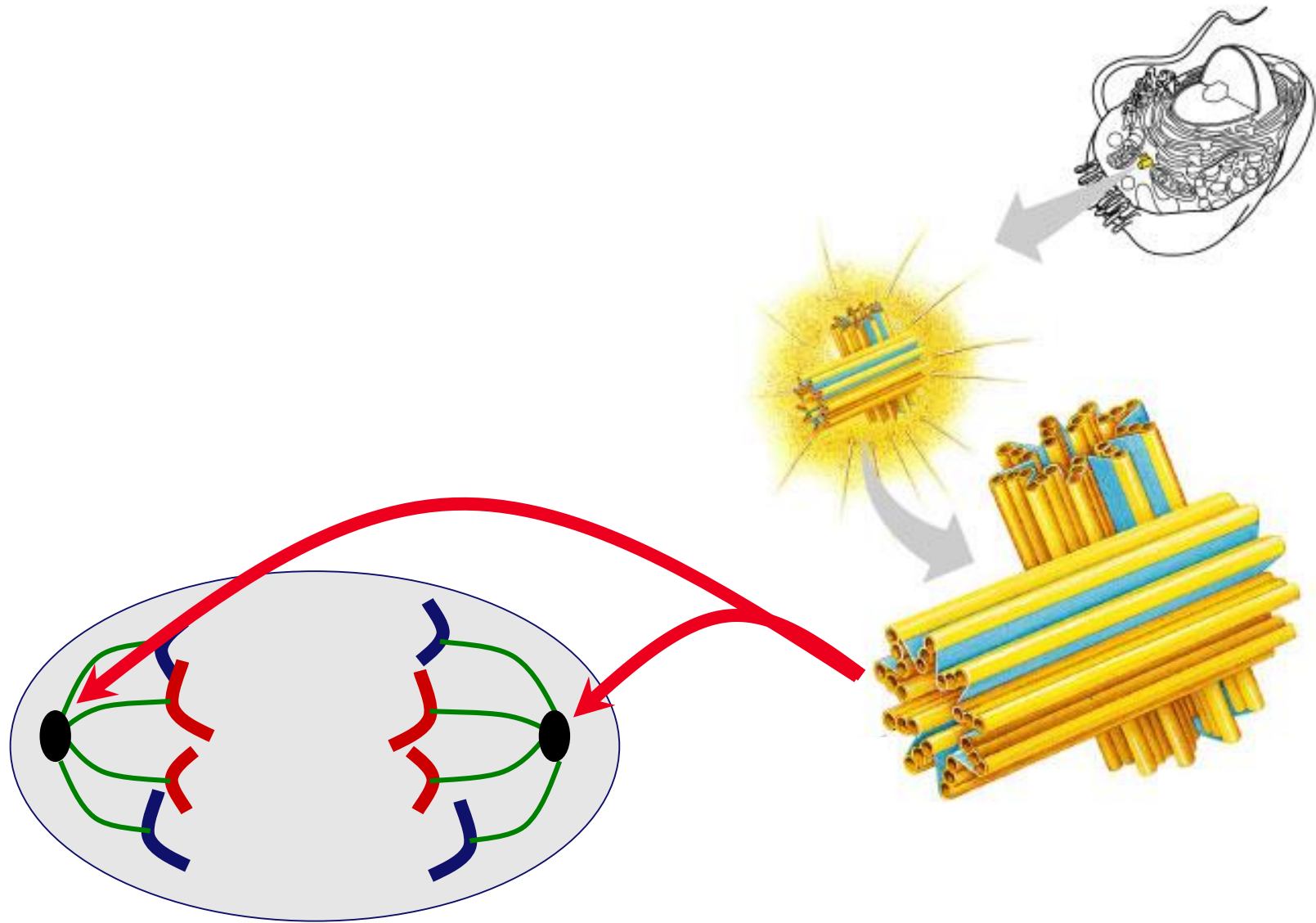
- works on proteins
- makes membranes

















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Tehnici de detectare a mutațiilor:

ASO.

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Real-Time PCR.

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ADN și ARN non-self.

**Tehnici de evaluare structurală și funcțională a organitelor celulare. Metode de studiu ale biologiei celulare. Fraționarea celulară**



## Izolarea organitelor celulare

- 1. ruperea membranelor celulare, de obicei prin tehnici mecanice;
- 2. fracțiunile concentrate de organite sunt apoi pregătite pentru separarea prin centrifugarea diferențială;
- 3. purificarea tipurilor de organite celulare, bazată pe diferența gradientelor de densitate (centrifugare în gradient de densitate).

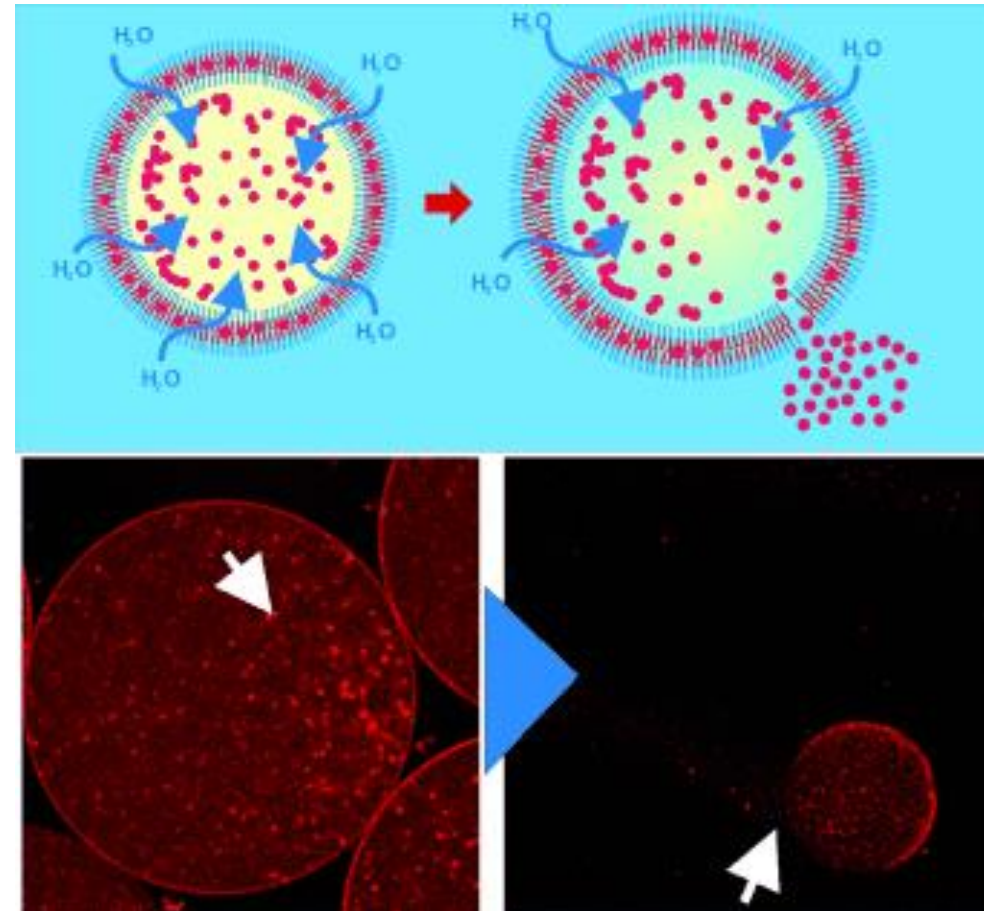
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- soc osmotic



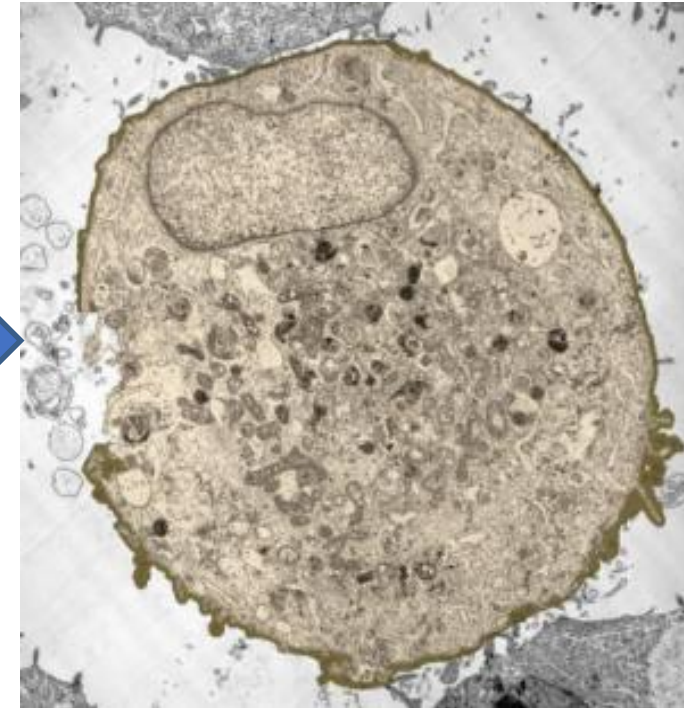
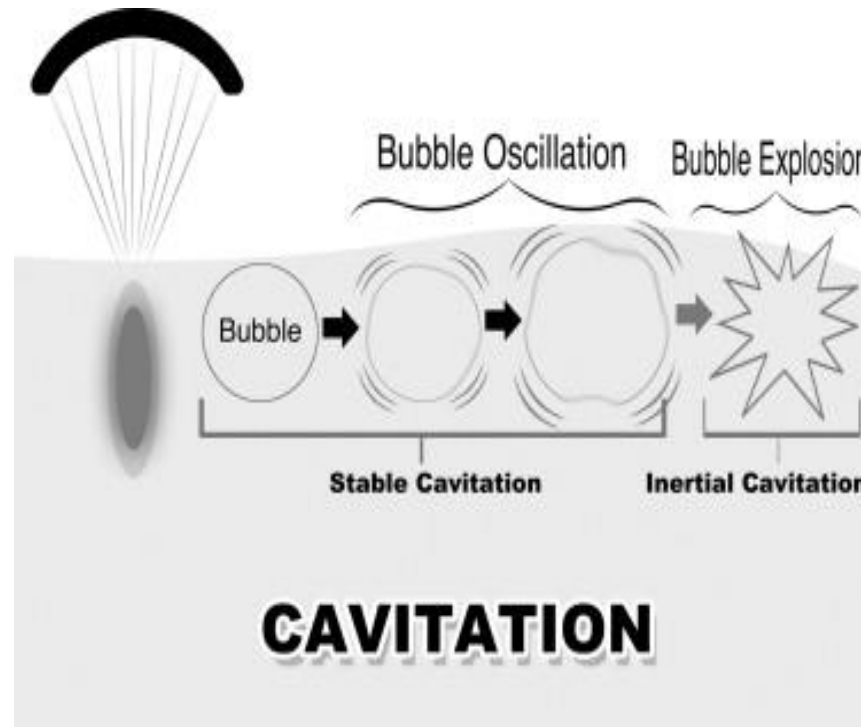
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- sonicație



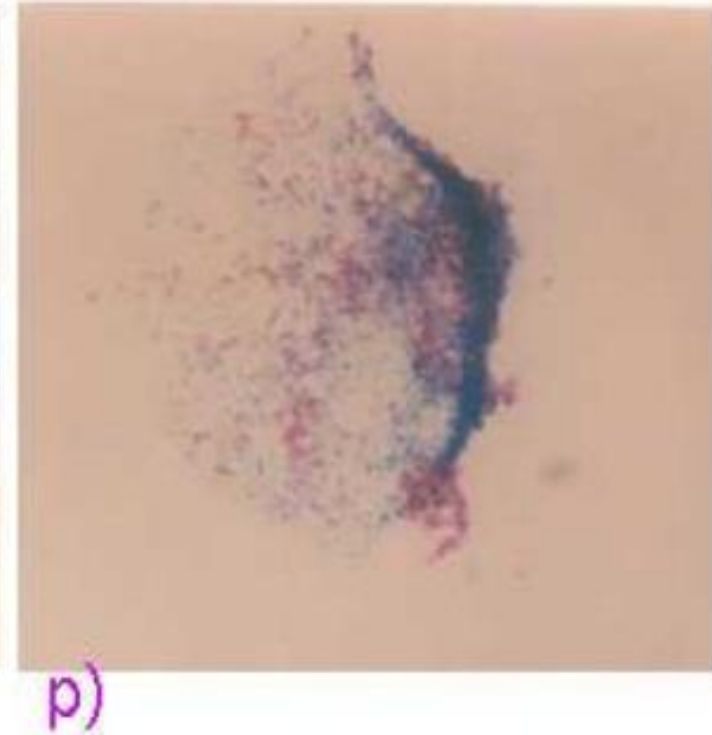
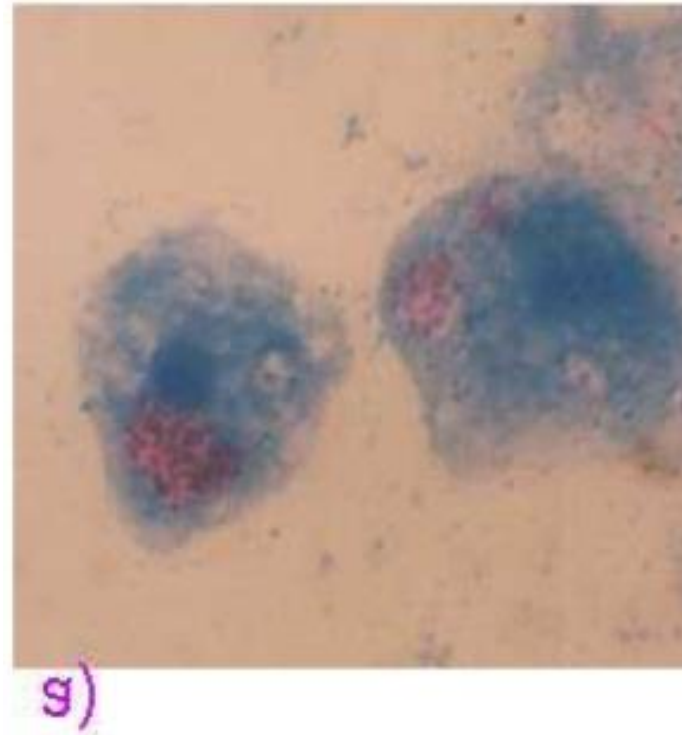
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- omogenizare



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- omogenizare



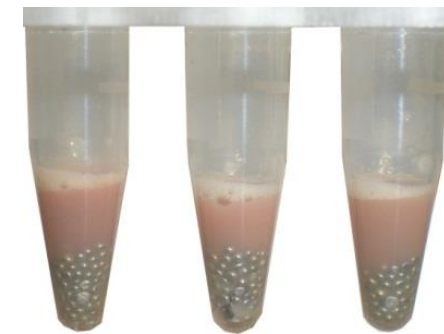
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- centrifugare



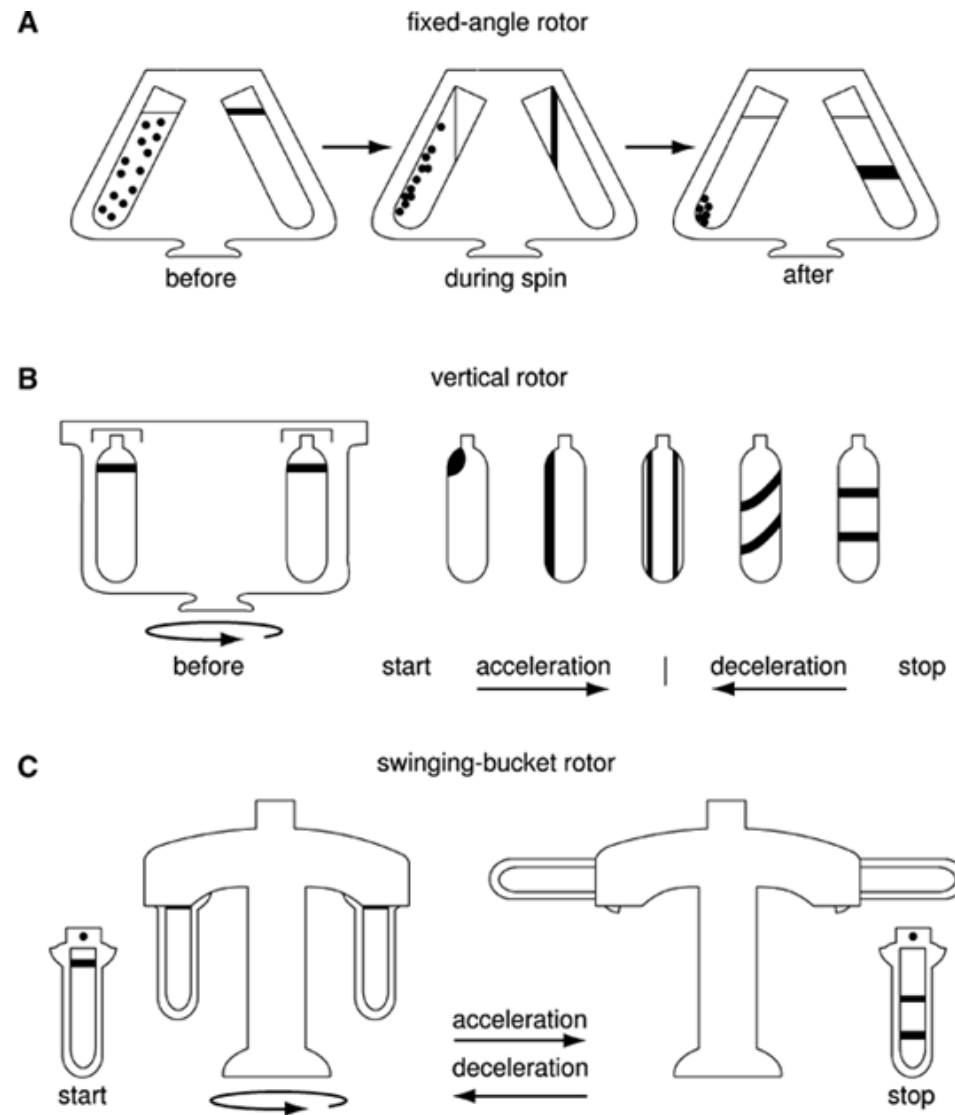
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- centrifugare

$$g = 1.12 \times R \times (RPM/1000)^2$$

**g – accelerația gravitațională**

**RPM – revolutii pe minut**





## Izolarea organelor celulare

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de obicei prin tehnici mecanice;

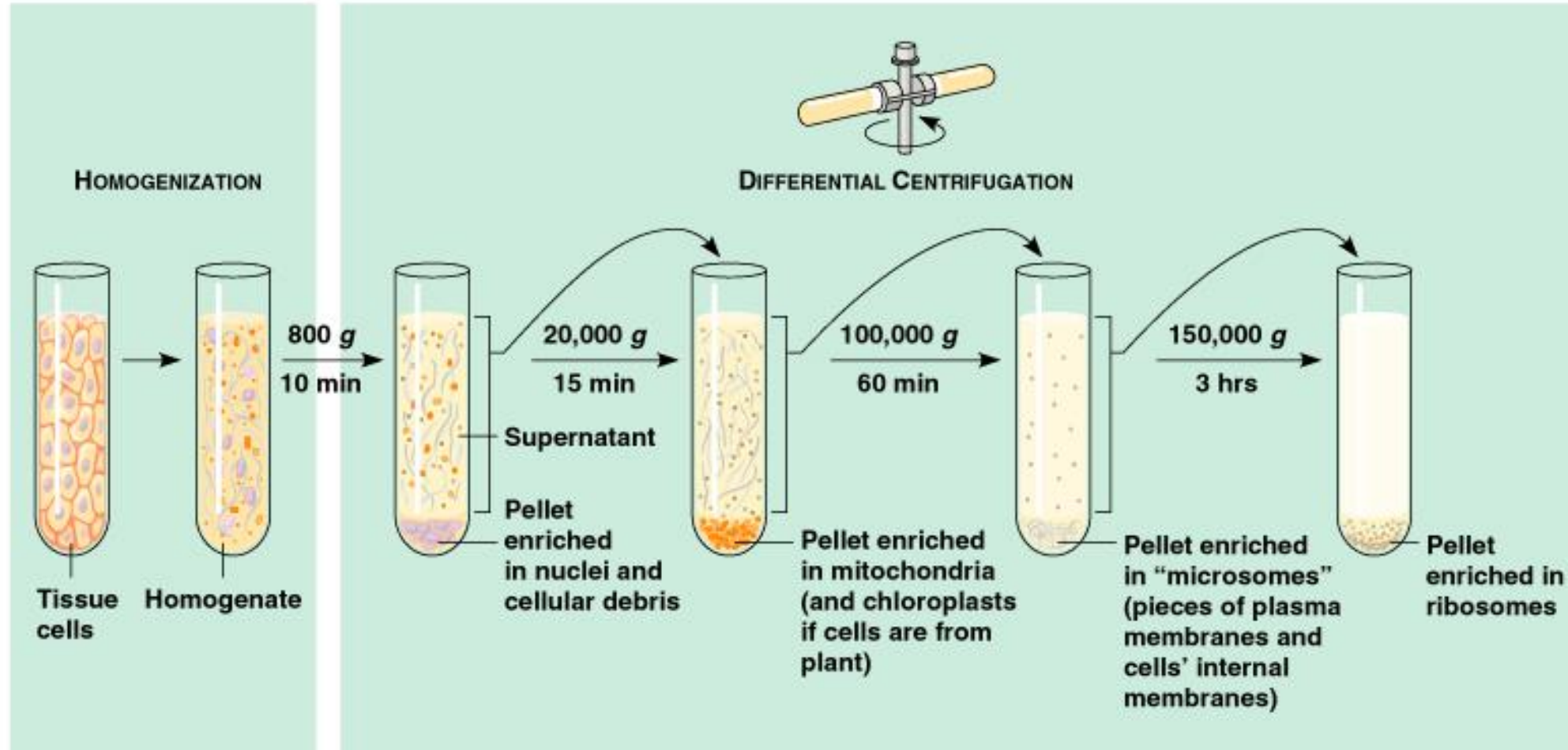
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densitate (centrifugare in  
gradient de densitate).**

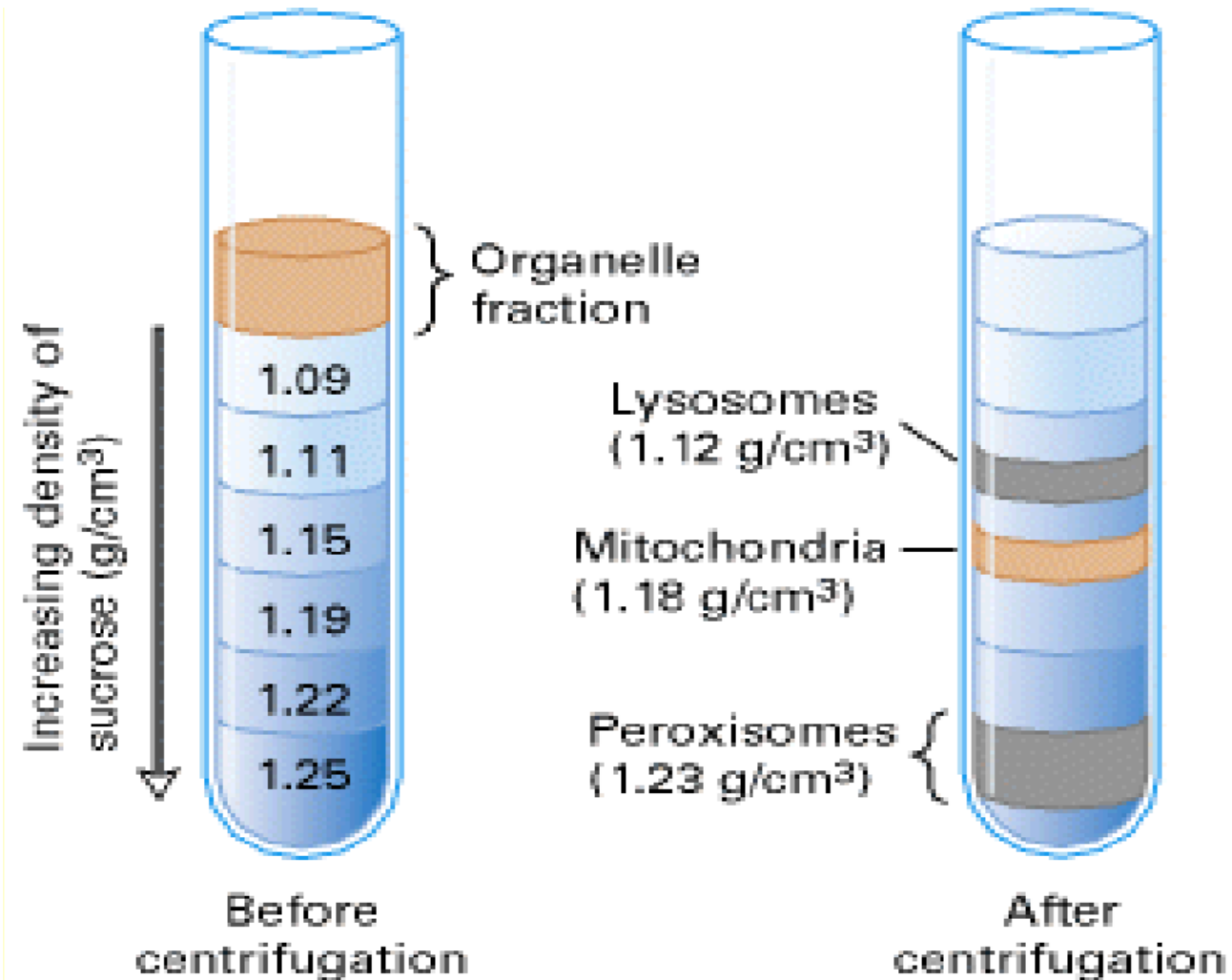
- centrifugare diferentiaala
- centrifugare in gradient de densitate



# centrifugare diferenciala



# centrifugare in gradient de densitate





# DISCUȚII

