

CELL THEORY

FORMULATED BY

MATTHIAS SCHLEIDEN, 1838
GERMAN BOTANIST

STUDY: ALL PLANTS

COMPOSED OF CELLS
WHICH FORMS TISSUE

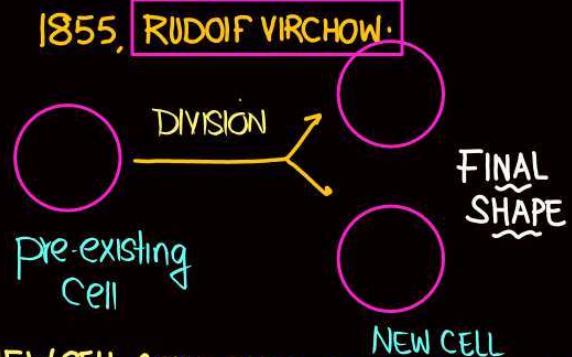
DRAWBACK

DIDN'T EXPLAIN

"HOW NEW CELLS WERE FORMED"

BUT

1855, RUDOLF VIRCHOW:



① NEW CELL ARISE BY DIVISION OF PRE-EXISTING CELL

Omnis cellula e cellula

NEET

② ALL LIVING ORGANISM: COMPOSED: CELL & PRODUCT OF CELL

THEODORE SCHWANN, 1839
BRITISH ZOOLOGIST

* STUDY: ANIMAL CELL → COVERED BY THIN LAYER
PLASMA MEMBRANE

* STUDY: PLANT CELL → CELL WALL PRESENCE:
UNIQUE CHARACTER

* HYPOTHESIS: PLANTS & ANIMALS

↓
COMPOSED

↓
CELL & ITS PRODUCT (TISSUE)

OVERVIEW OF CELL : EUKARYOTE CELL.

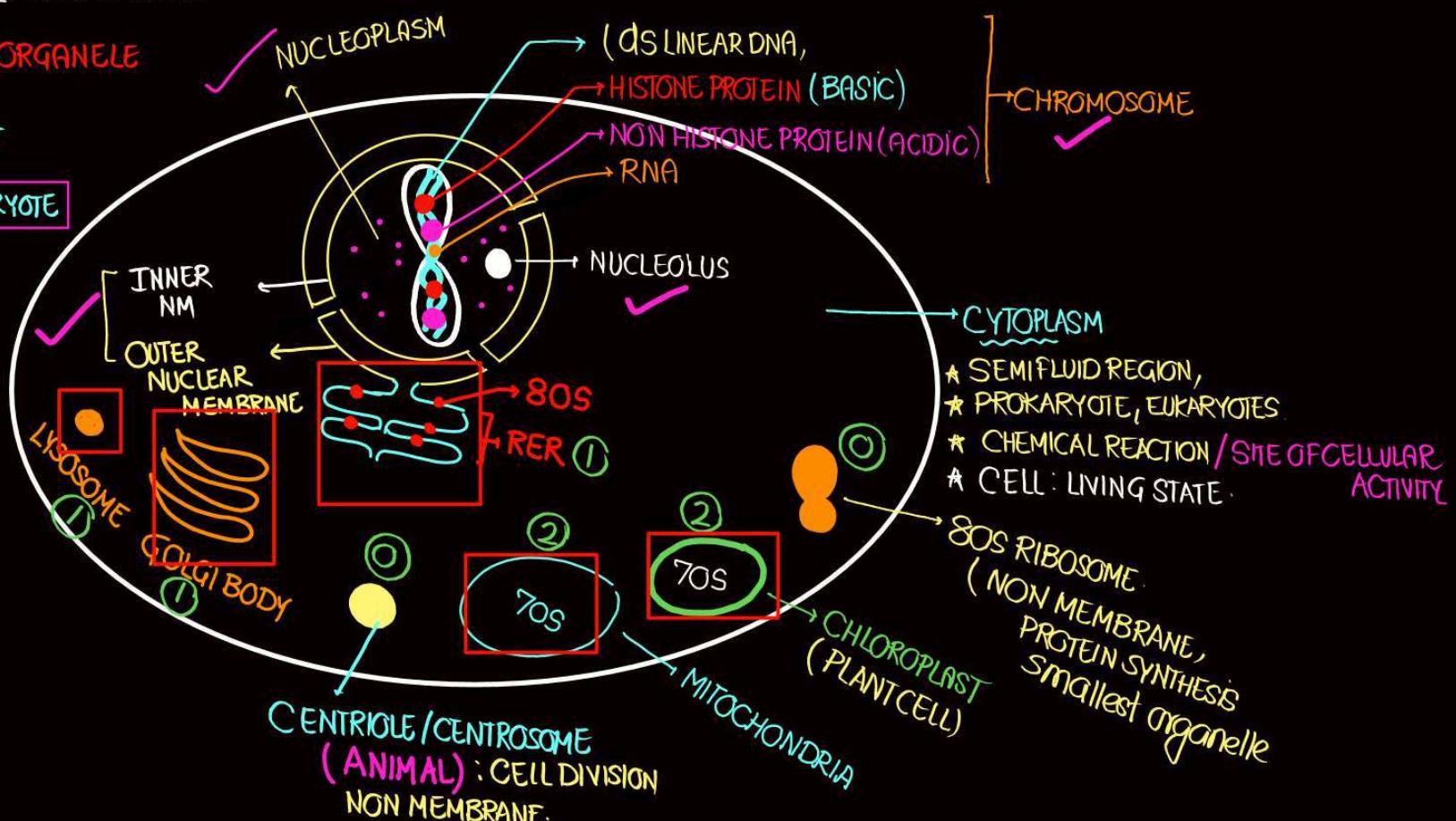
→ ONION PEEL: PLANT: CELL WALL
 → HUMAN CHEEK: ANIMAL: CELL MEMBRANE } → DELIMITING LAYER.

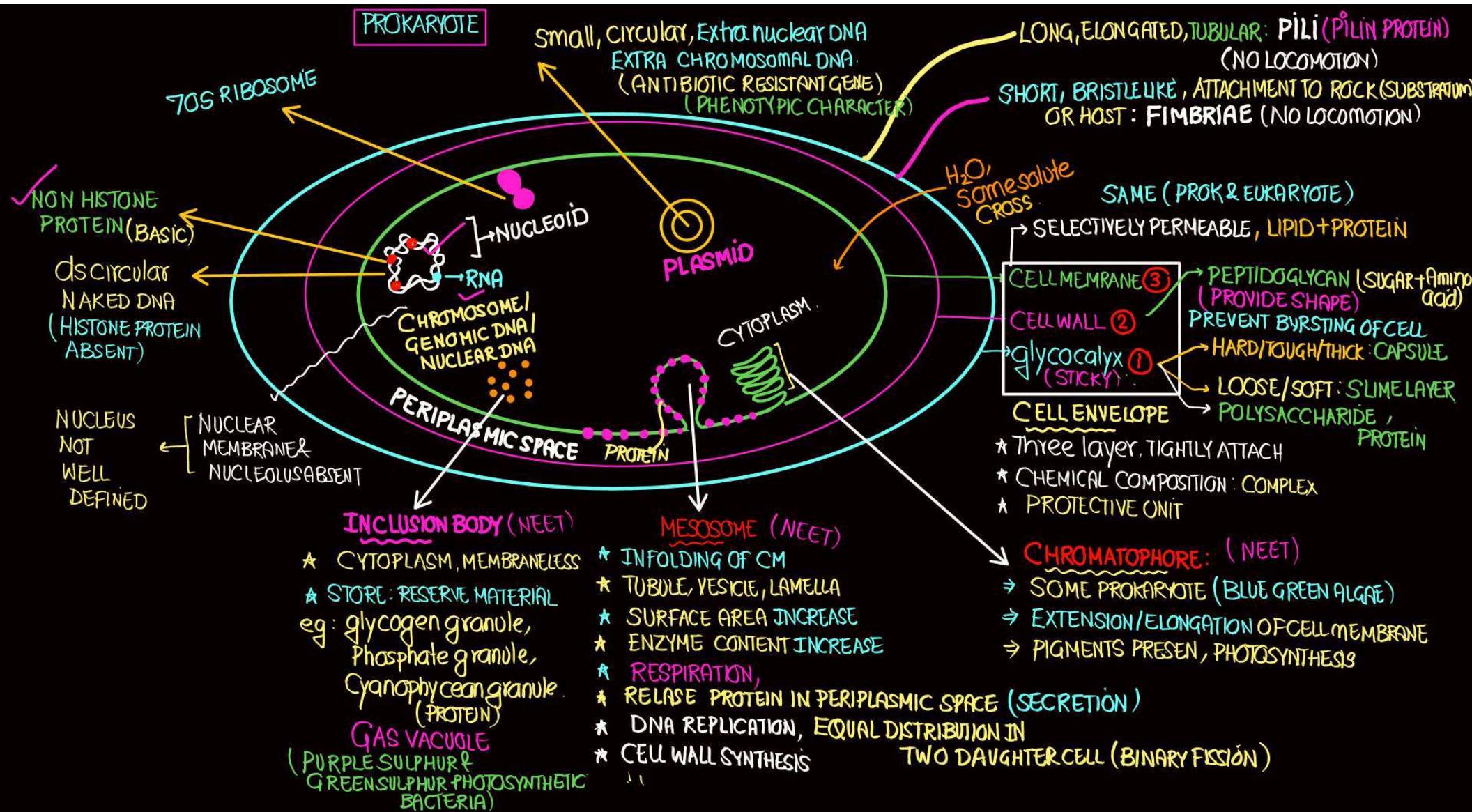
→ MEMBRANE BOUND ORGANELLE

PRESENT
 ↓
EUKARYOTE

ABSENT
 ↓
PROKARYOTE

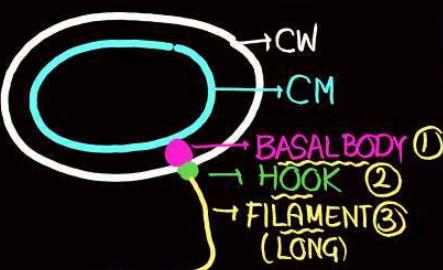
→ WELL DEFINED NUCLEUS: PRESENT.





FLAGELLA

EXTENSION OF CELL WALL



NOT COVERED BY
CELL MEMBRANE

⇒ NUMBER & DISTRIBUTION:
VARY IN BACTERIA

⇒ FLAGELLIN PROTEIN

⇒ LOCOMOTION (MOTILE)

GRAM STAINING

G⁺ve

RETAIN
CRYSTAL VIOLET
DYE AFTER
ALCOHOL
WASHING

VIOLET/
PURPLE

G⁻ve.

LOSE
DYE
AFTER
WASHING

PINK

* PROKARYOTES

BACTERIA

BLUEGREEN ALGAE

MYCOPLASMA: CELL WALL
OR
ABSENT

PPLO (PLEUROPNEUMONIA)
LIKE ORGANISM

CATTLE: LUNG: PLEURAL FLUID

PNEUMONIA ← ISOLATE
ORGANISM

SHAPE OF BACTERIA

4 TYPES

COCCUS : SPHERICAL ○

BACILLUS : ROD LIKE ━

VIBRIO : COMMA LIKE ,

SPIRILUM : SPIRAL {

* PROK

SIZE: small

MULTIPLY: FAST

EUKARY

LARGE

SLOW

POLYRIBOSOME / POLYSOME

→ MANY RIBOSOME
ON SINGLE
messenger RNA
(mRNA)

TRANSLATION

PROTEIN WITH HELP OF
RIBOSOME

PLANT

Cell wall



X

PLASTID



X

LARGE CENTRAL
VACUOLE



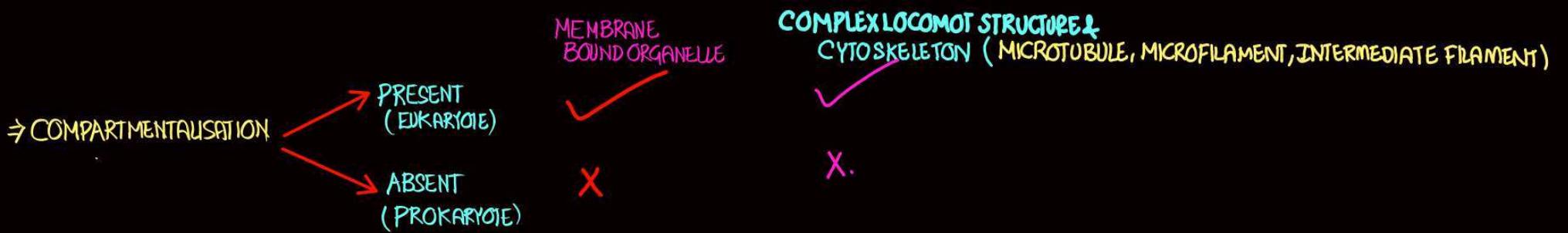
X

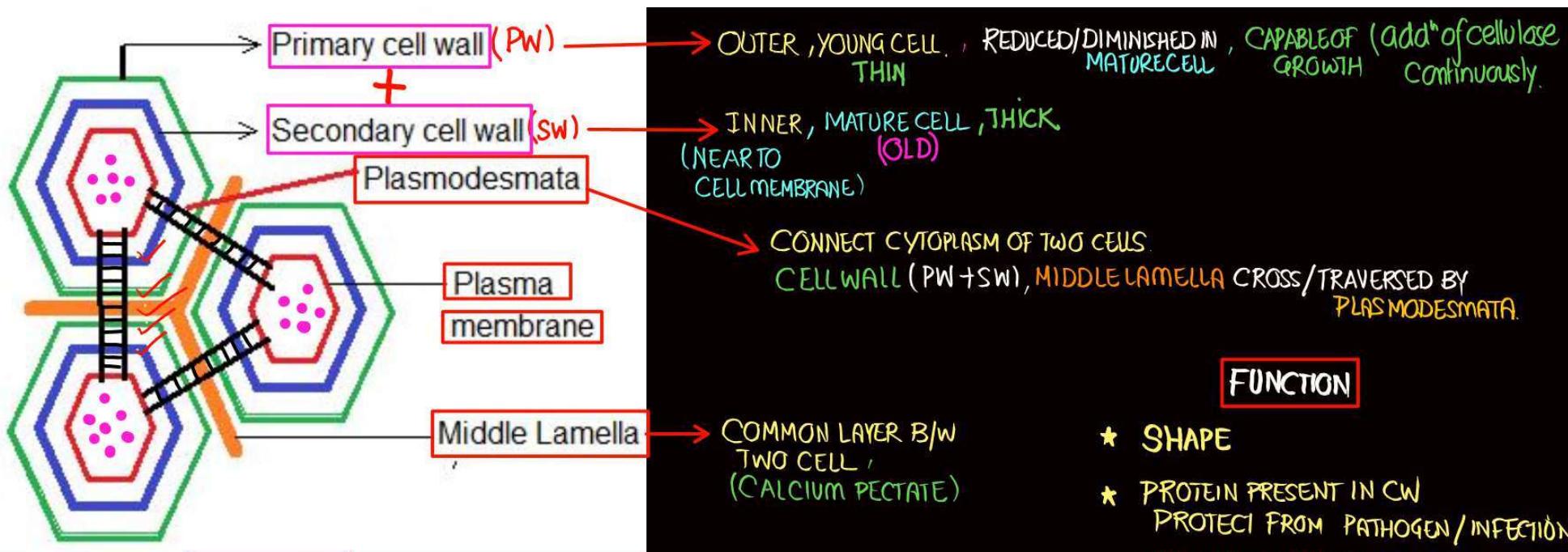
CENTRIOLE



✓

ANIMAL CELL

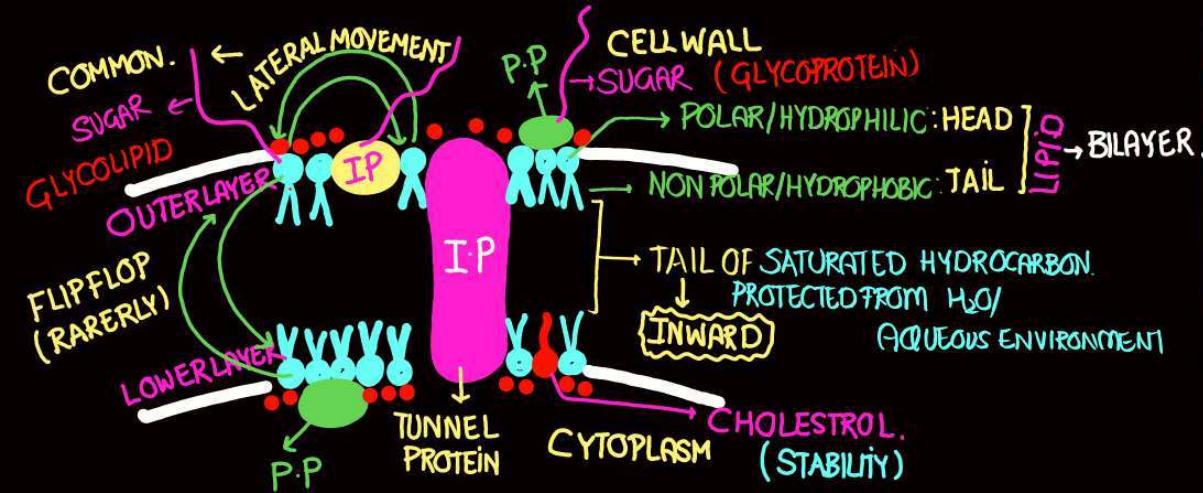




- ⇒ RIGID/HARD LAYER, NON-LIVING
- ⇒ OUTER TO CELL MEMBRANE (MINERAL)
- ⇒ ALGAE: CELLULOSE, GALACTAN, MANNAN, CaCO_3
- ⇒ PLANT: CELLULOSE, HEMICELLULOSE, PECTIN, PROTEIN
- ⇒ FUNGI: CHITIN

FUNCTION

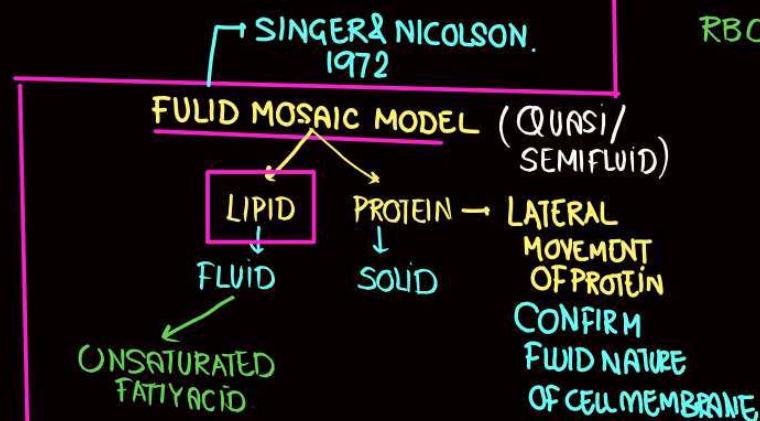
- * SHAPE
- * PROTEIN PRESENT IN CW PROTECT FROM PATHOGEN/INFECTION
- * PROVIDE BARRIER TO UNDESIRABLE MACROMOLECULE (LARGE SIZE)
- * CELL TO CELL INTERACTION.



P.P.: PERIPHERAL PROTEIN, EASY
IP: INTEGRAL PROTEIN, DIFFICULT

TOTALY BURIED (2 LAYER)
PARTIALLY (1 LAYER) BURIED

COMMON LIPID: PHOSPHOLIPID



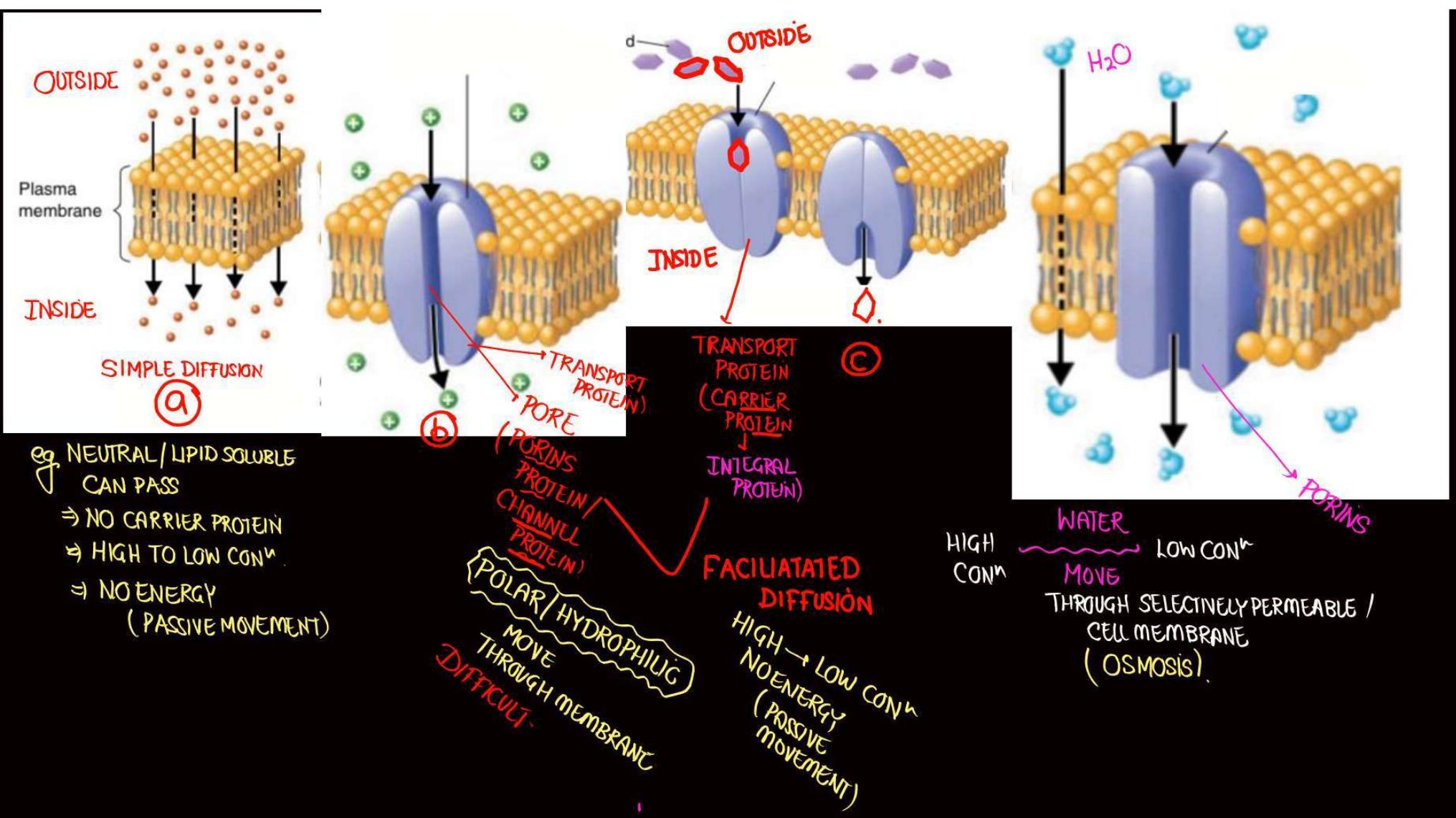
→ CHEMICAL STUDY: HUMAN RBC: CELL MEMBRANE (LIPID + PROTEIN)

→ BIOCHEMICAL STUDY

Membrane: Carbohydrate also present

RBC Membrane: 52% P]
↓ 40% L]

THIS RATIO
VARY IN
DIFFERENT
CELL MEMBRANE.



Active TRANSPORT

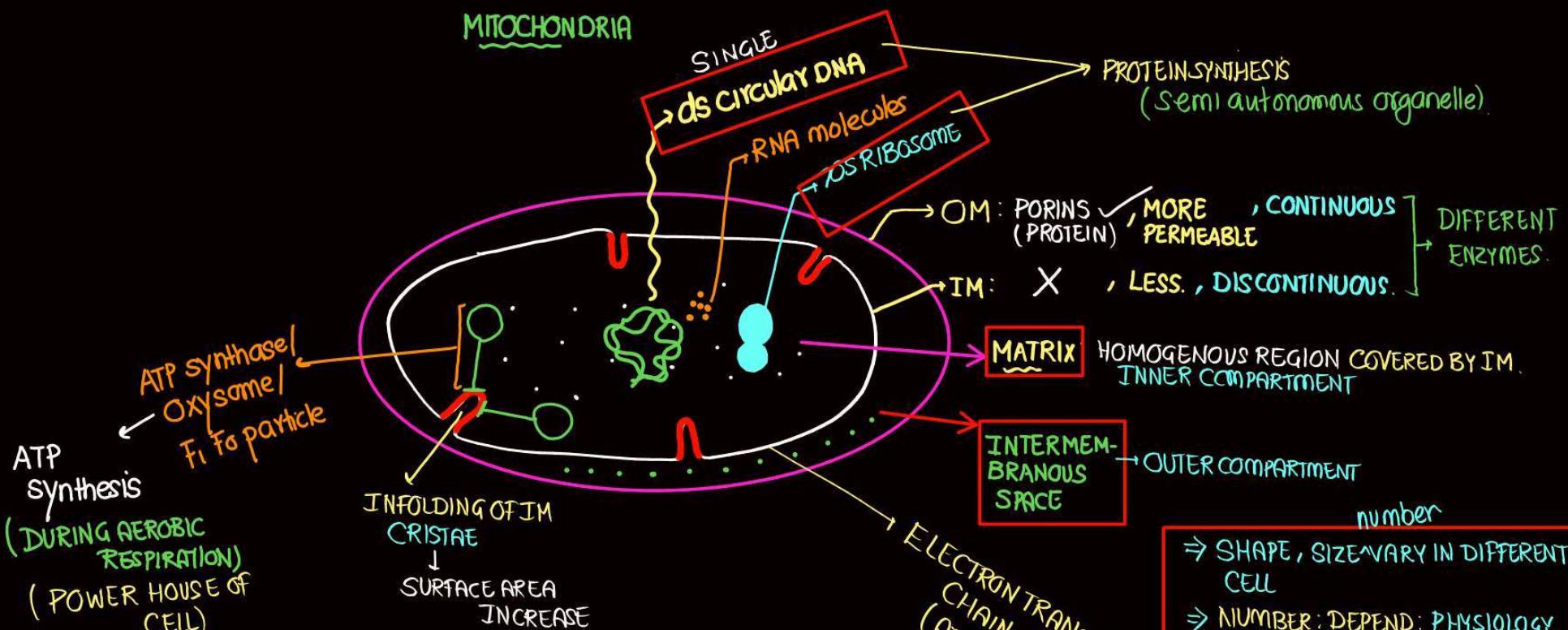
→ LOW → HIGH CONⁿ (SOME MOLECULES/
IONS)

→ AGAINST CONCENTRATION

→ ATP / ENERGY ✓

→ CARRIER PROTEIN ✓

e.g. Na⁺K⁺pump



- ⇒ DIVIDE BY BINARY FISSION
- ⇒ CYLINDRICAL / SAUSAGE STRUCTURE
- ⇒ NOT VISIBLE IN MICROSCOPE UNTIL STAIN BY DYE.

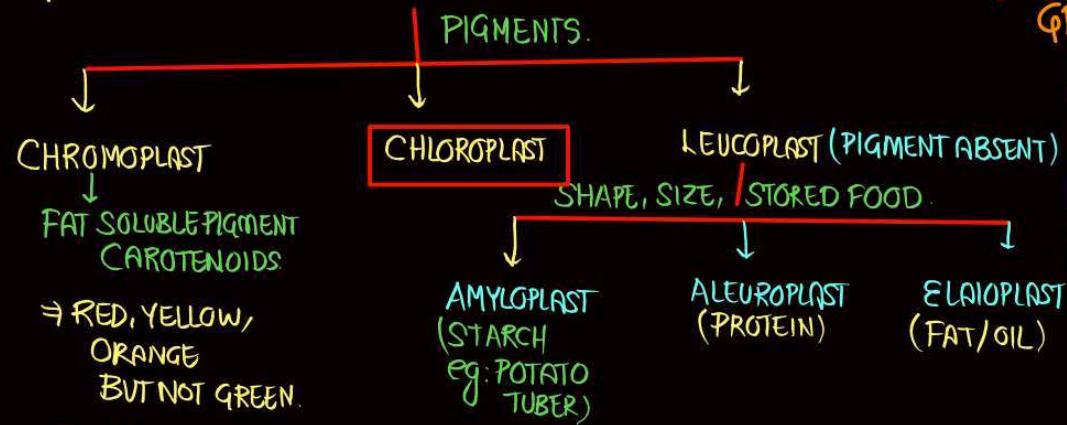
number
 ⇒ SHAPE, SIZE VARY IN DIFFERENT CELL
 ⇒ NUMBER: DEPEND: PHYSIOLOGY OF CELL.

PLASTID

⇒ ALL PLANTS, EUGLENOID: PRESENT

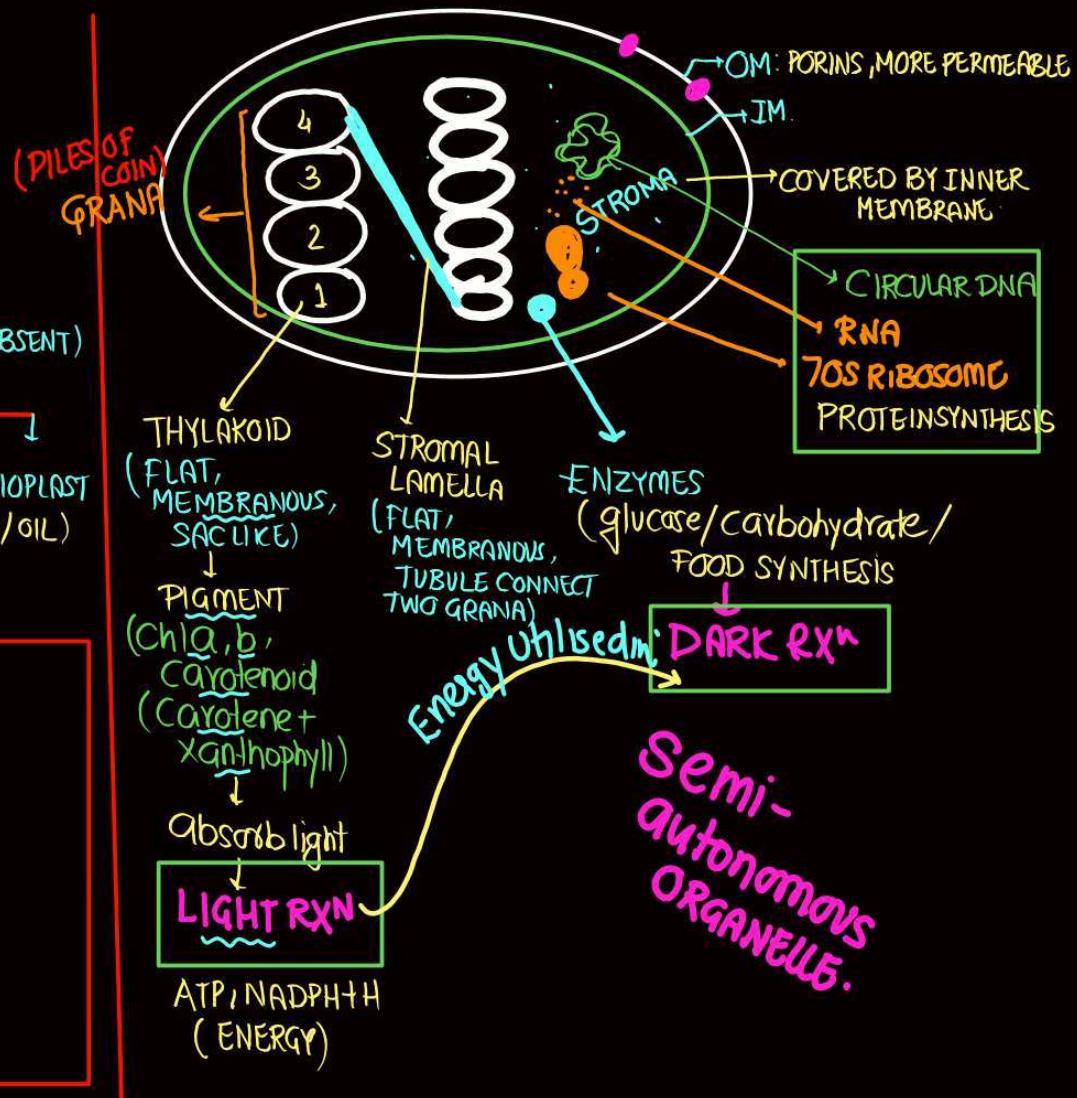
⇒ LARGE ORGANELLE: VISIBLE IN MICROSCOPE

⇒ PIGMENTS PRESENT



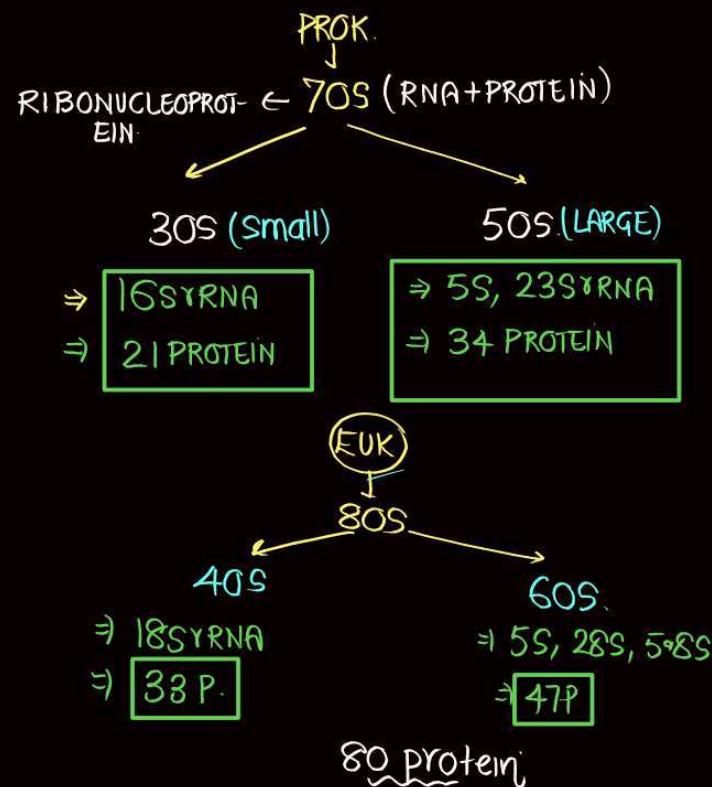
⇒ RED, YELLOW,
ORANGE
BUT NOT GREEN.

e.g.: TOMATO,
CARROT



RIBOSOME

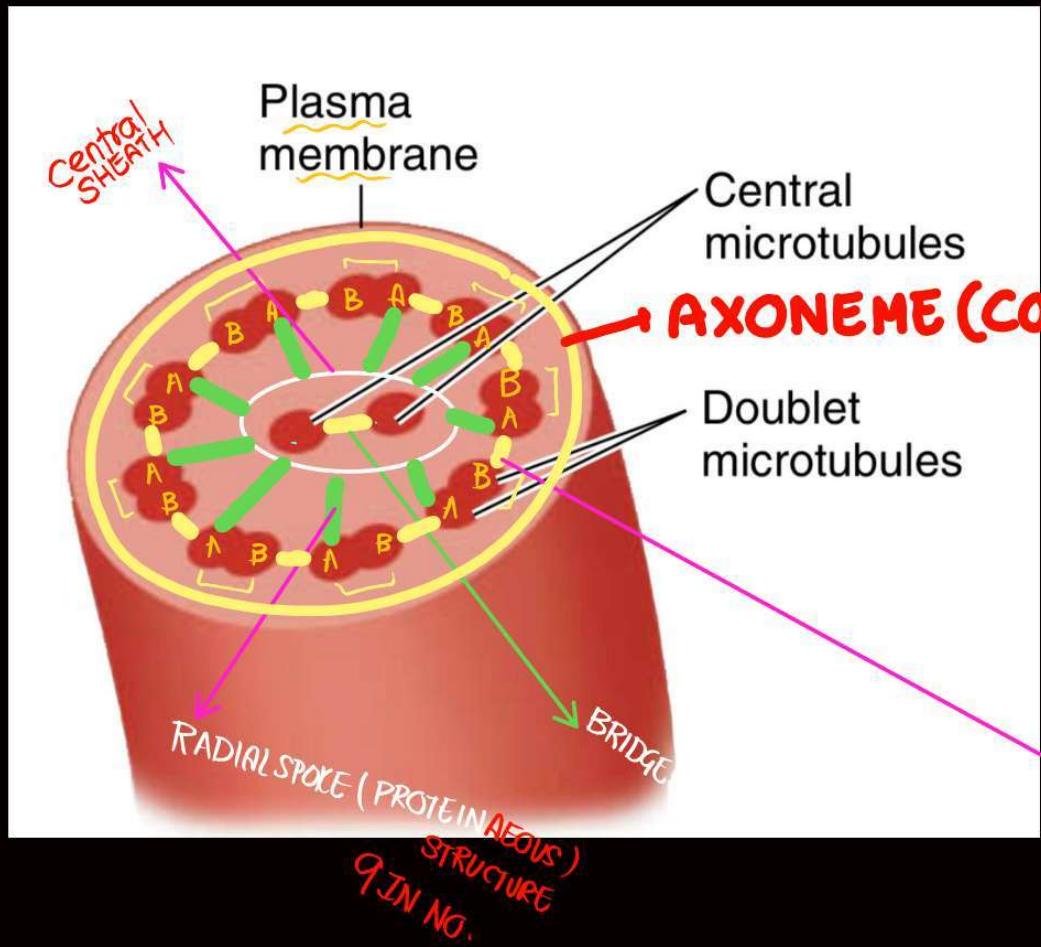
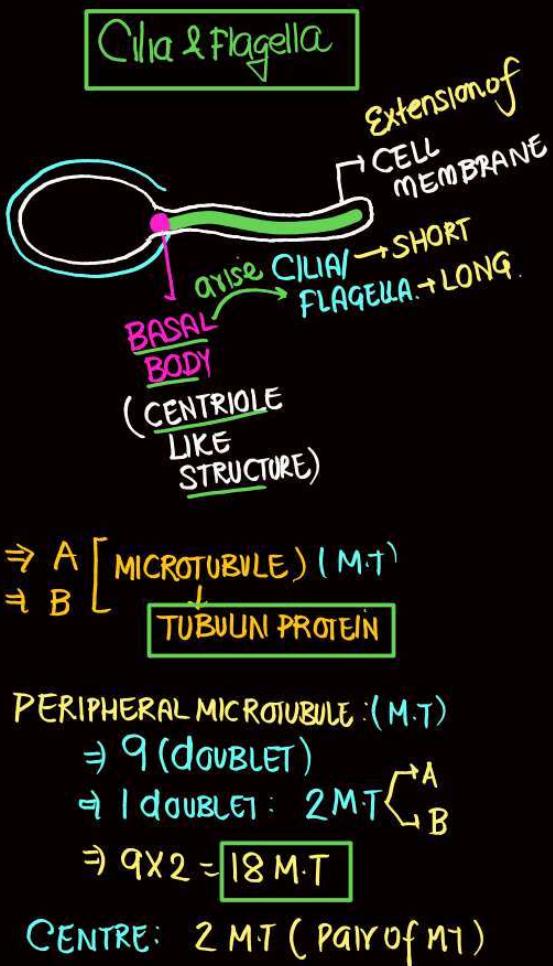
⇒ PROTEIN SYNTHESIS, MEMBRANLESS
SMALLEST ORGANELLE, PALADE PARTICLE.



S: Svedberg UNIT

↓
IS SEDIMENTATION COEFFICIENT (VELOCITY)
HIGH.

(Indirect measure
Size & density)



(Peripheral centre.)

9 (doublet) + 2

$9 \times 2 = 18 + 2$

$\approx 20 \text{ M.T.}$

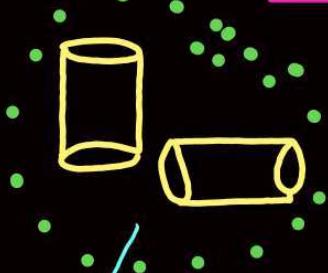
⇒ Central M.T connected BY BRIDGE

⇒ Central M.T covered By central SHEATH

⇒ RADIAL SPOKE: 9 arise from one of TWO (A M.T)

⇒ INTERDOUBLET/LINKERS CONNECT TWO PERIPHERAL DOUBLET

CENTROSOME & CENTRIOLE



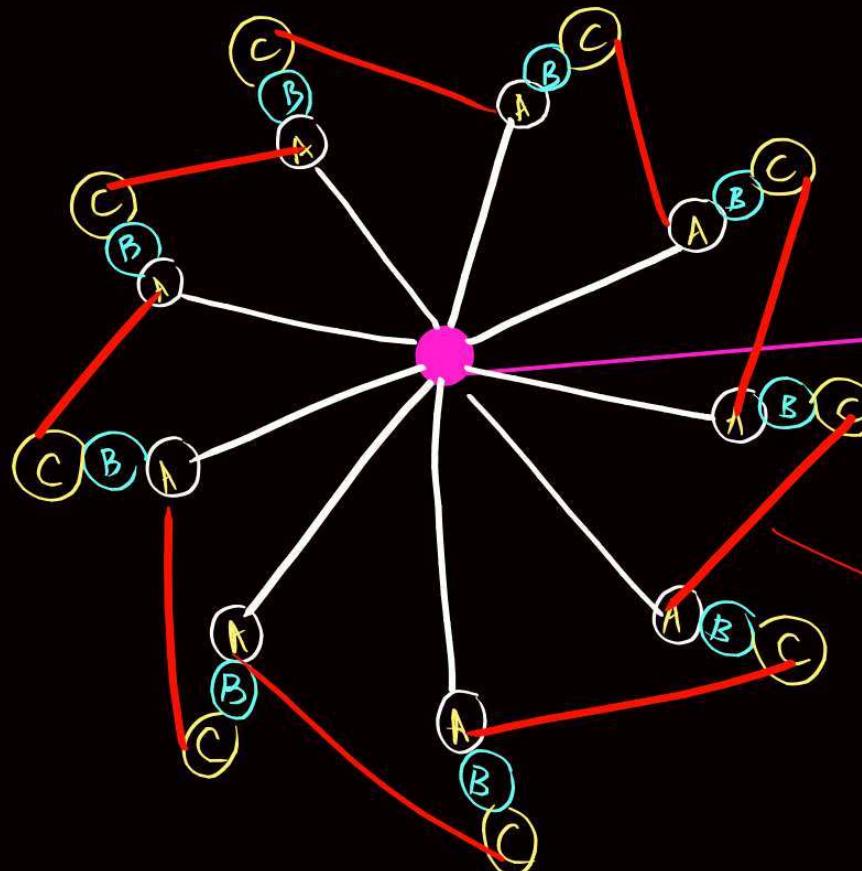
Pericentriolar
material
(protein)

⇒ 1 CENTROSOME:

2 CENTRIOLE
(CYLINDRICAL
STRUCTURE)

⇒ 90° to each other

⇒ membranless, cartwheel
structure



⇒ PERIPHERAL: 9 TRIPLET

⇒ 1 TRIPLET: 3 M.T (A, B, C)

$$\Rightarrow \text{PERIP: } 9 \times 3 = 27 \text{ M.T}$$

⇒ CENTRAL HUB: PROTEINAEOUS
STRUCTURE

⇒ 9 (TRIPLET) + O

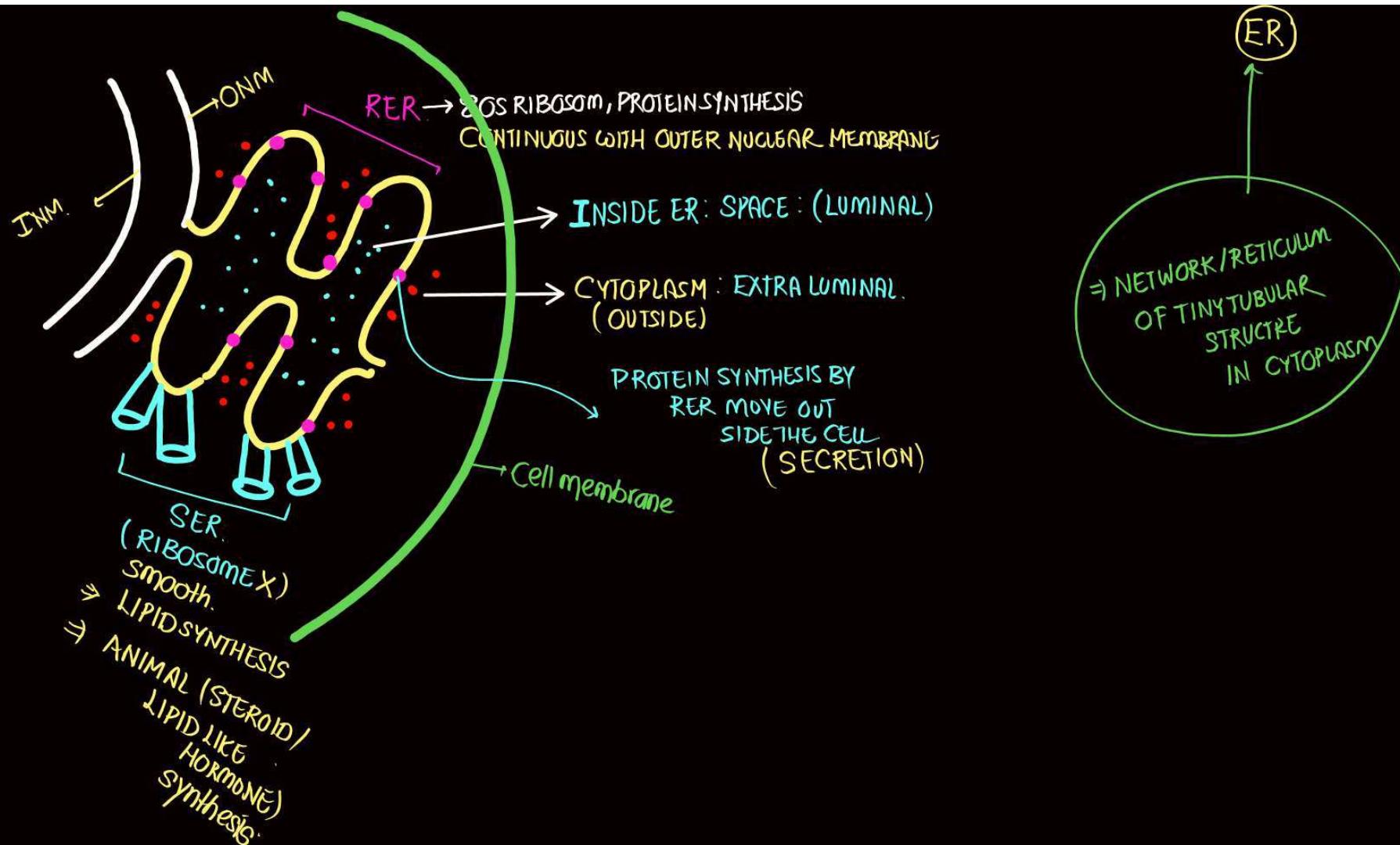
$$\Rightarrow 9 \times 3 = 27 + 0 = 27$$

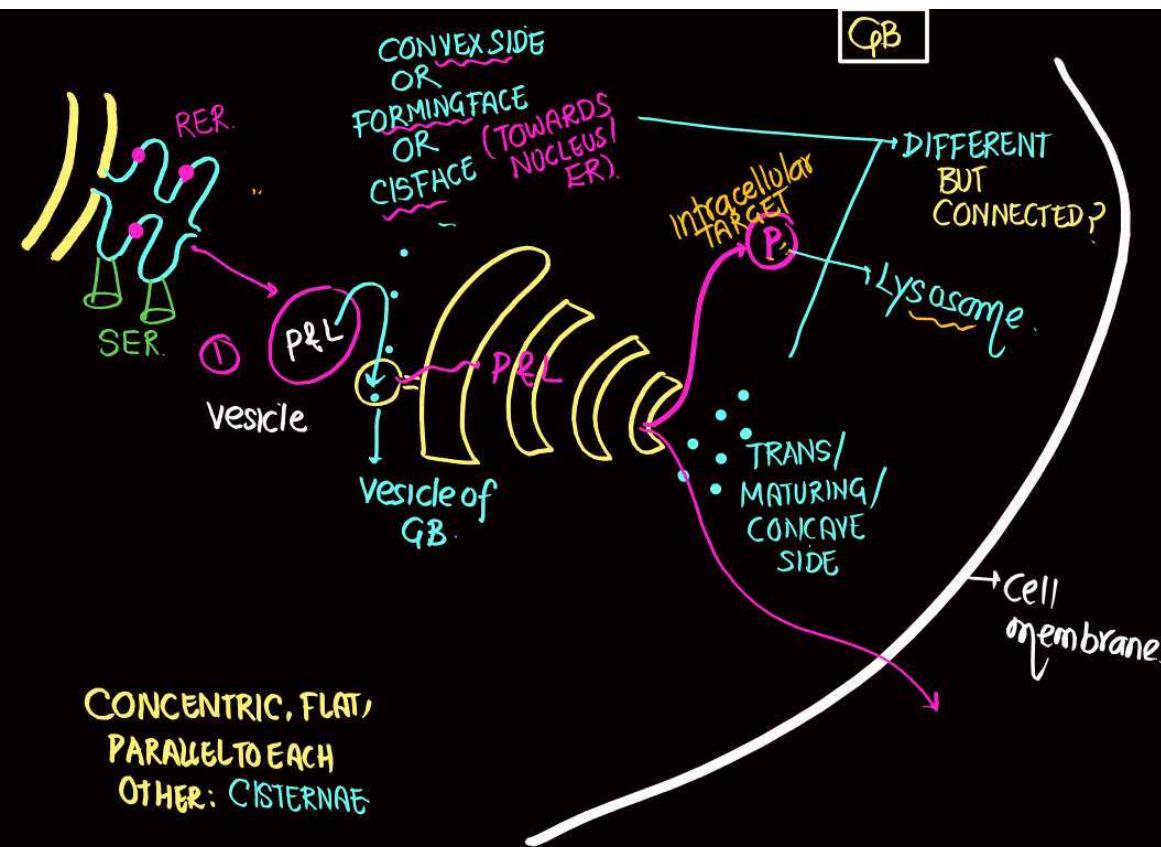
⇒ 9 RADIAL SPOKE
(PROTEIN)

⇒ A LINKER
(PROTEIN)

⇒ Cell division in
animal cell

⇒ HELP SPINDLE FIBRE
FORMATION





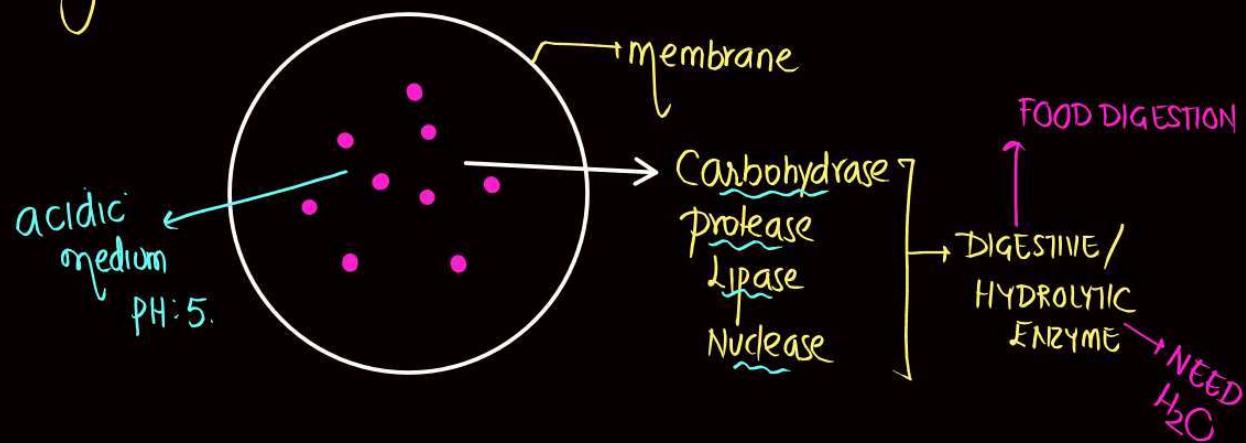
- ① Vesicle come from ER (PROTEIN & LIPID)
- ② moves to CIS side of GB
- ③ P & L enters into Vesicle of GB.
- ④ P & L moves to cisternae.
 $P + \text{Sugar} \rightarrow \text{glycoprotein}$ (glycosylation of protein)
 $L + \text{Sugar} \rightarrow \text{glycolipid}$ (modification of lipid)
- ⑤ Some protein move outside the cell (secretory protein)
- ⑥ Some protein after modification release inside the cell in form of Lysosome
- ⑦ Lysosome formed due to packaging By g.B. But RER provide protein for synthesis of lysosome

ENDOMEMBRANE SYSTEM : ER, GB, LYSOSOME, VACUOLE (WORK IN COORDINATION)

NON ENDOMEMBRANE SYSTEM : MITOCHONDRIA,
CHLOROPLAST,
PEROXISOME (NOT WORK IN
COORDINATION)

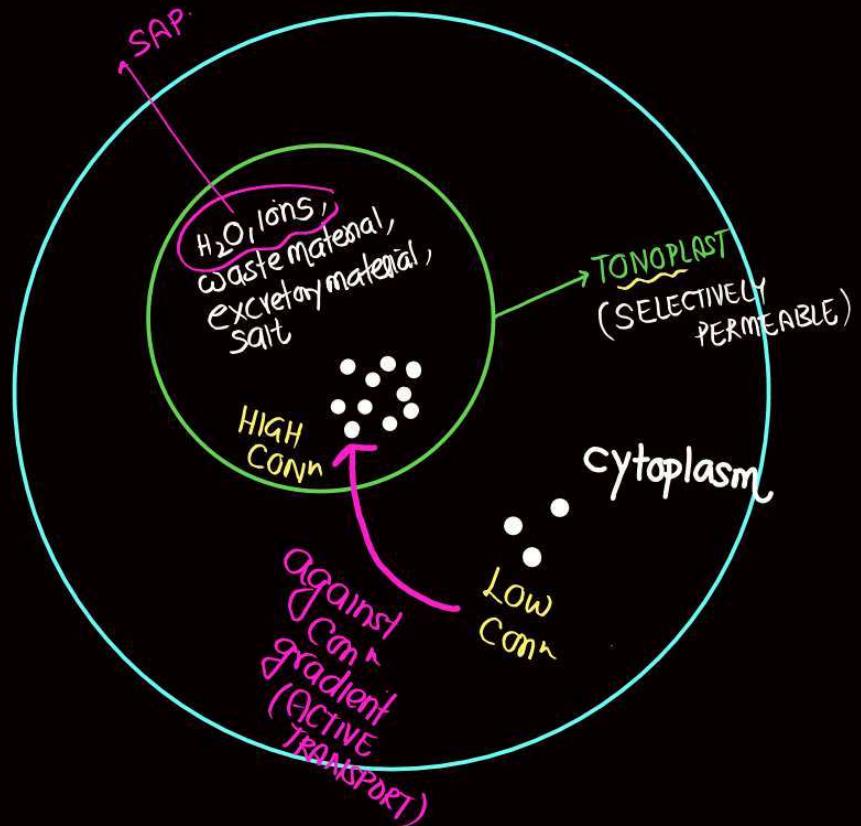
Lysosome

⇒ formation By G.B.



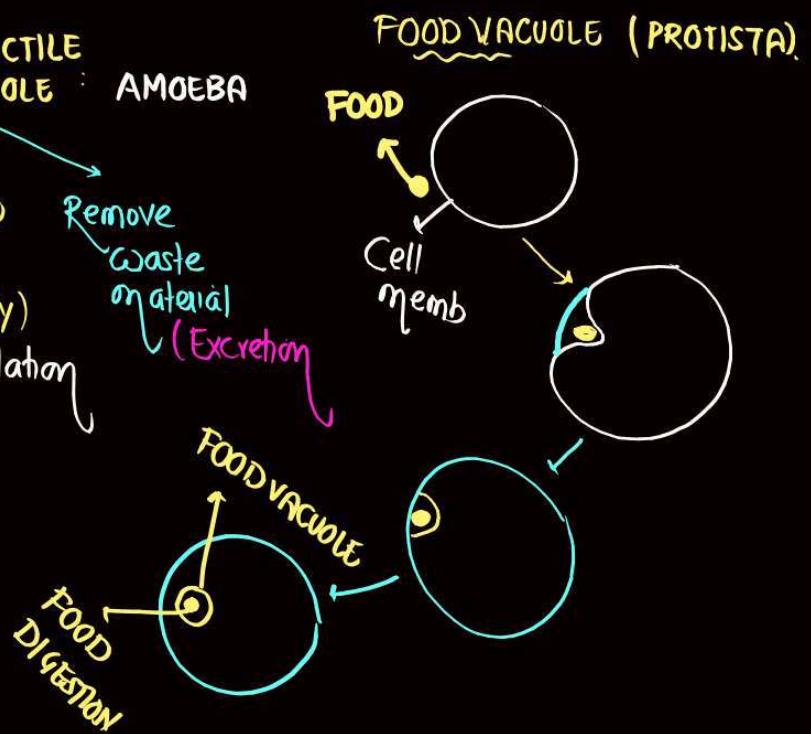
VACUOLE

: PLANT CELL,
LARGE, OCCUPY 90% VOLUME OF CELL



CONTRACTILE VACUOLE : AMOEBA

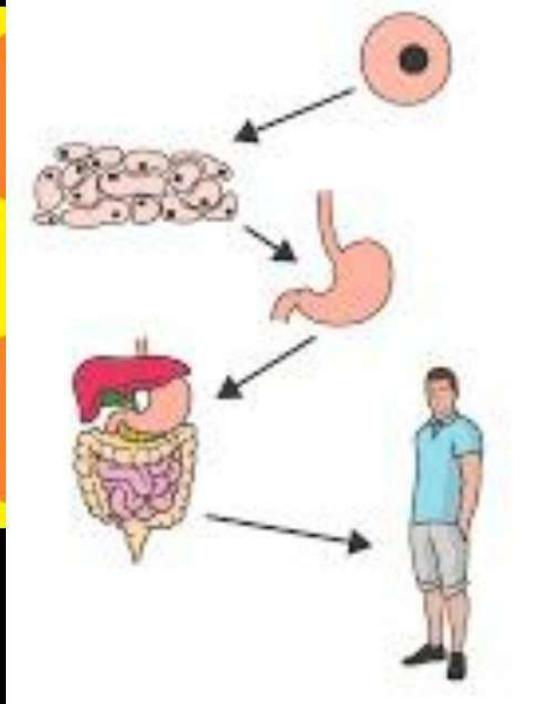
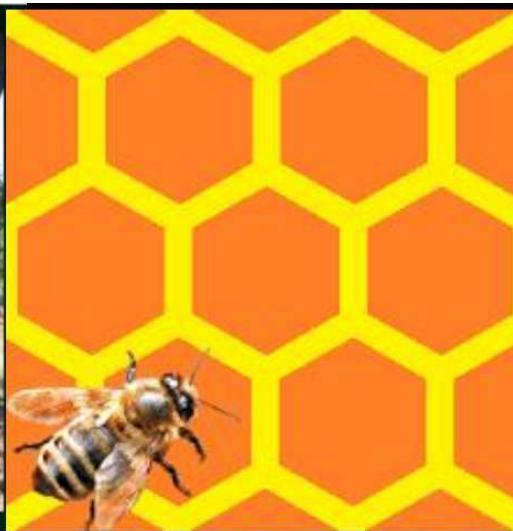
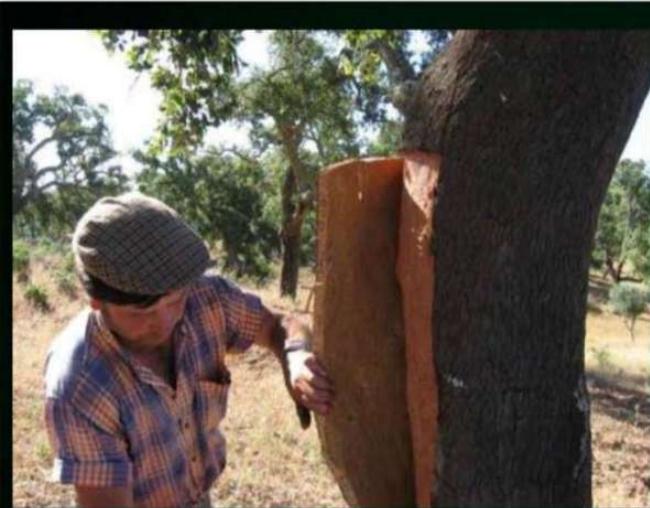
- Excess H₂O (Remove from Body)
- Remove waste material (Excretion)
- Osmoregulation



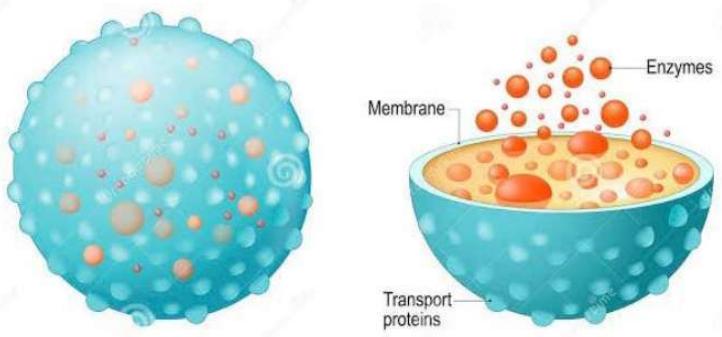
PRACHAND SERIES

TELEGRAM CHANNEL

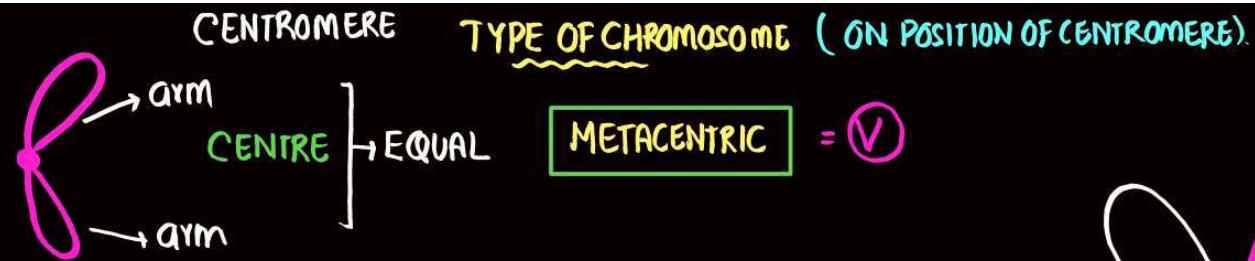
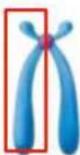
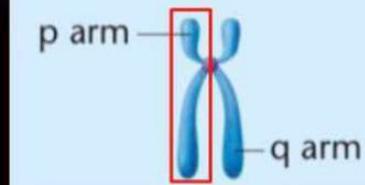
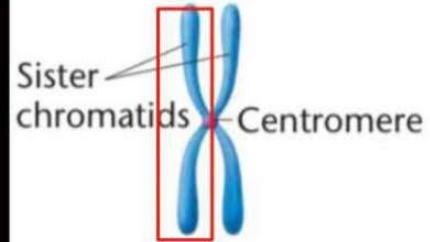




LYSOSOME

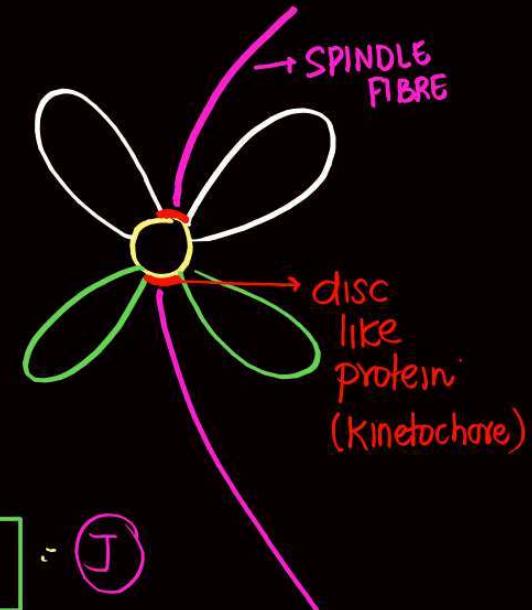






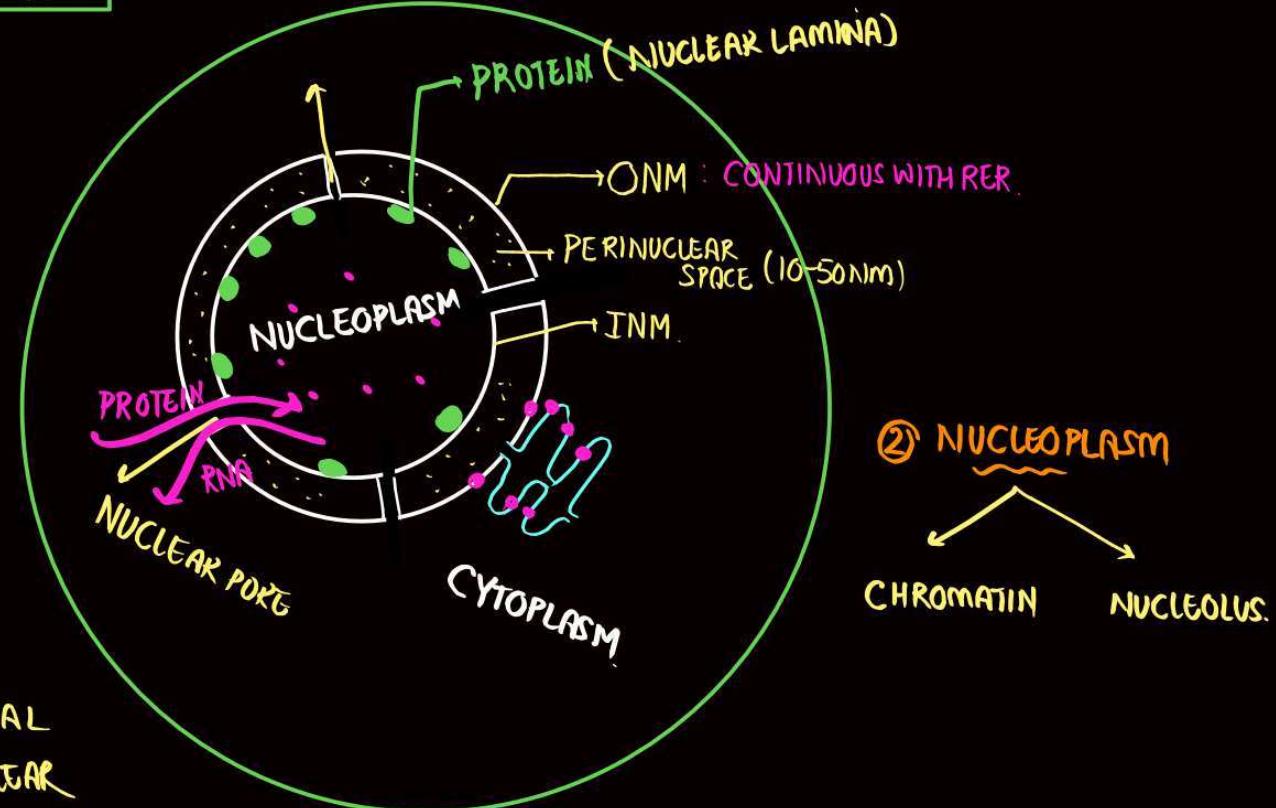
→ Centromere Terminal
I shape

TELOCENTRIC



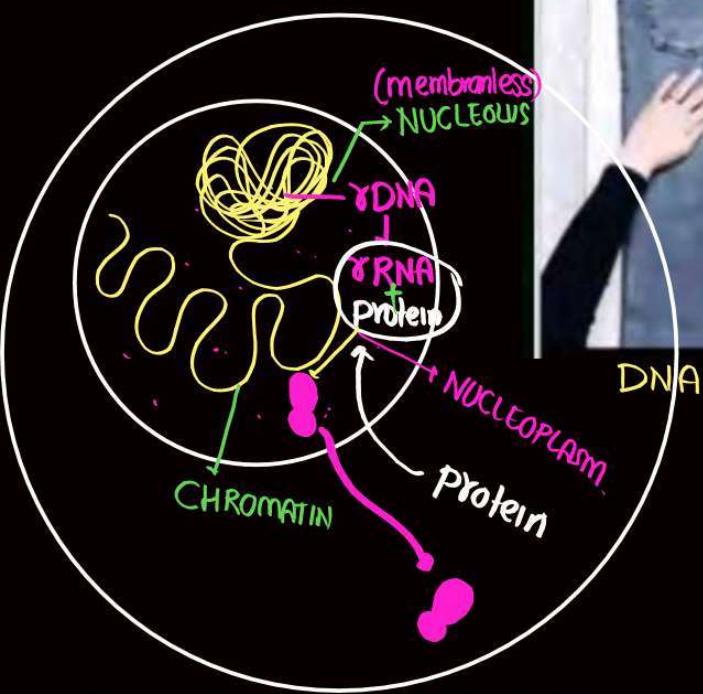
NUCLEUS

- ⇒ ROBERT BROWN, 1831
- ⇒ cell: generally: one nucleus.
- ⇒ paramecium: Two nucleus.
- ⇒ Mature Sieve Tube, Mammalian RBC NUCLEUS ABSENT
 ↓
 LIVING.
- ① NUCLEAR MEMBRANE
 ⇒ DOUBLE LAYER.
- ⇒ PERINUCLEAR SPACE / NM SEPERATE CYTOPLASM & NUCLEOPLASM
- ⇒ protein & RNA: BIDIRECTIONAL MOVEMENT THROUGH NUCLEAR PORE.



③ CHROMATIN:

flattening, stain by BASIC DYE



NOTE: NUCLEOLUS: MORE IN NUMBER,
LARGE IN SIZE
(CELL ACTIVELY
INVOLVED
PROTEIN SYNTHESIS)



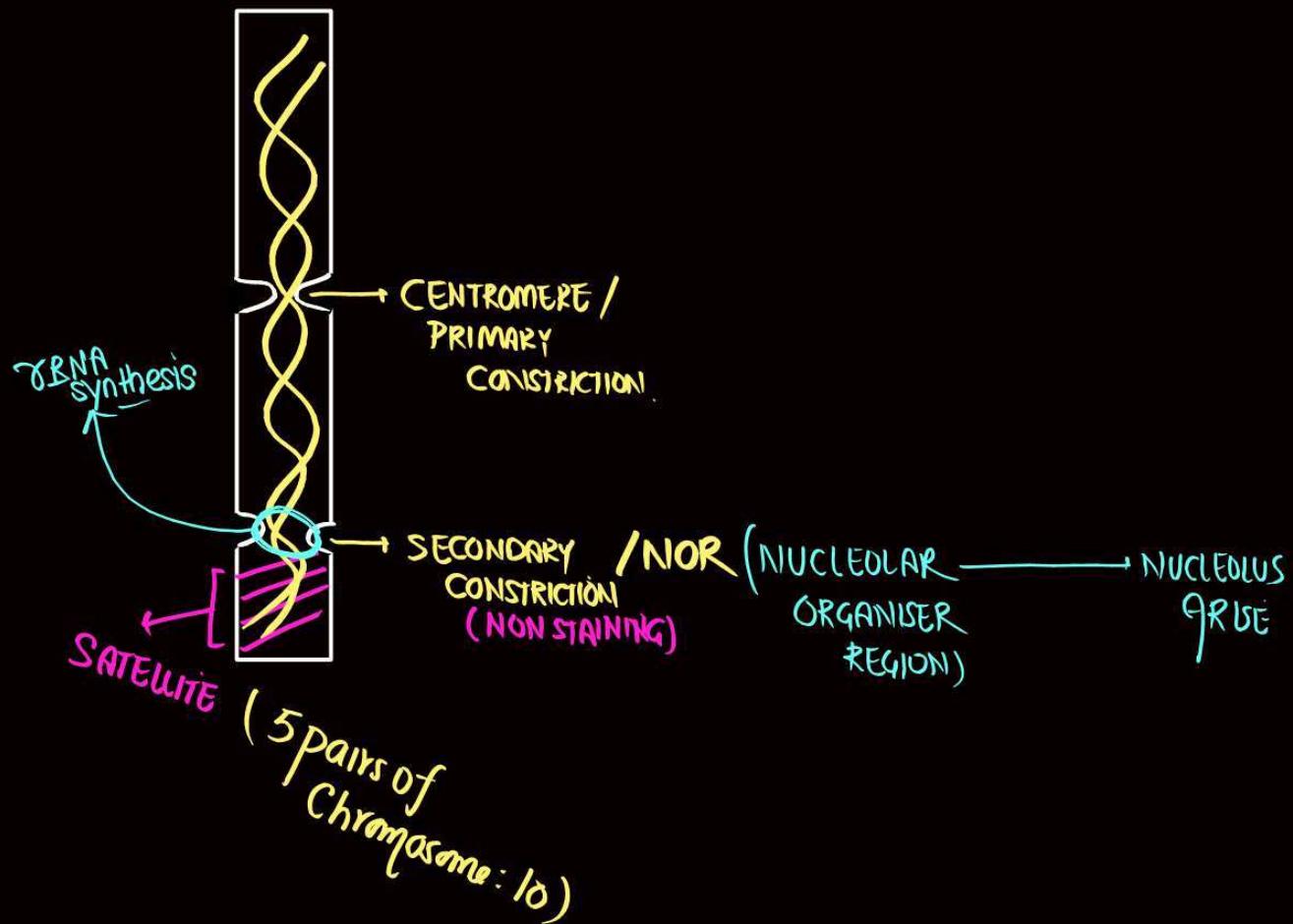
DNA → Chromatin
⇒ LONG
⇒ THIN
⇒ INDISTINCT / DECONDENSED
⇒ INTERPHASE (NON-DIVIDING)
⇒ LOOSE

Chromatin → Chromosome
⇒ SHORT
⇒ THICK
⇒ DISTINCT / CONDENSED.
⇒ PRO, META, ANA (DIVIDING PHASE)

me

- ⇒ Chromatin: collected (NUCLEOLUS)
- ⇒ No separation Betw NUCLEOLUS & NUCLEOPLASM Because NUCLEOLUS IS MEMBRANELESS.
- ⇒ NUCLEOLUS → (rDNA) → (tRNA)
- ⇒ Protein → NUCLEUS (cytoplasm)
- ⇒ tRNA + protein → RIBOSOME (NUCLEUS)
- ⇒ RIBOSOME → CYTOPLASM (NUCLEUS)

Chromosome



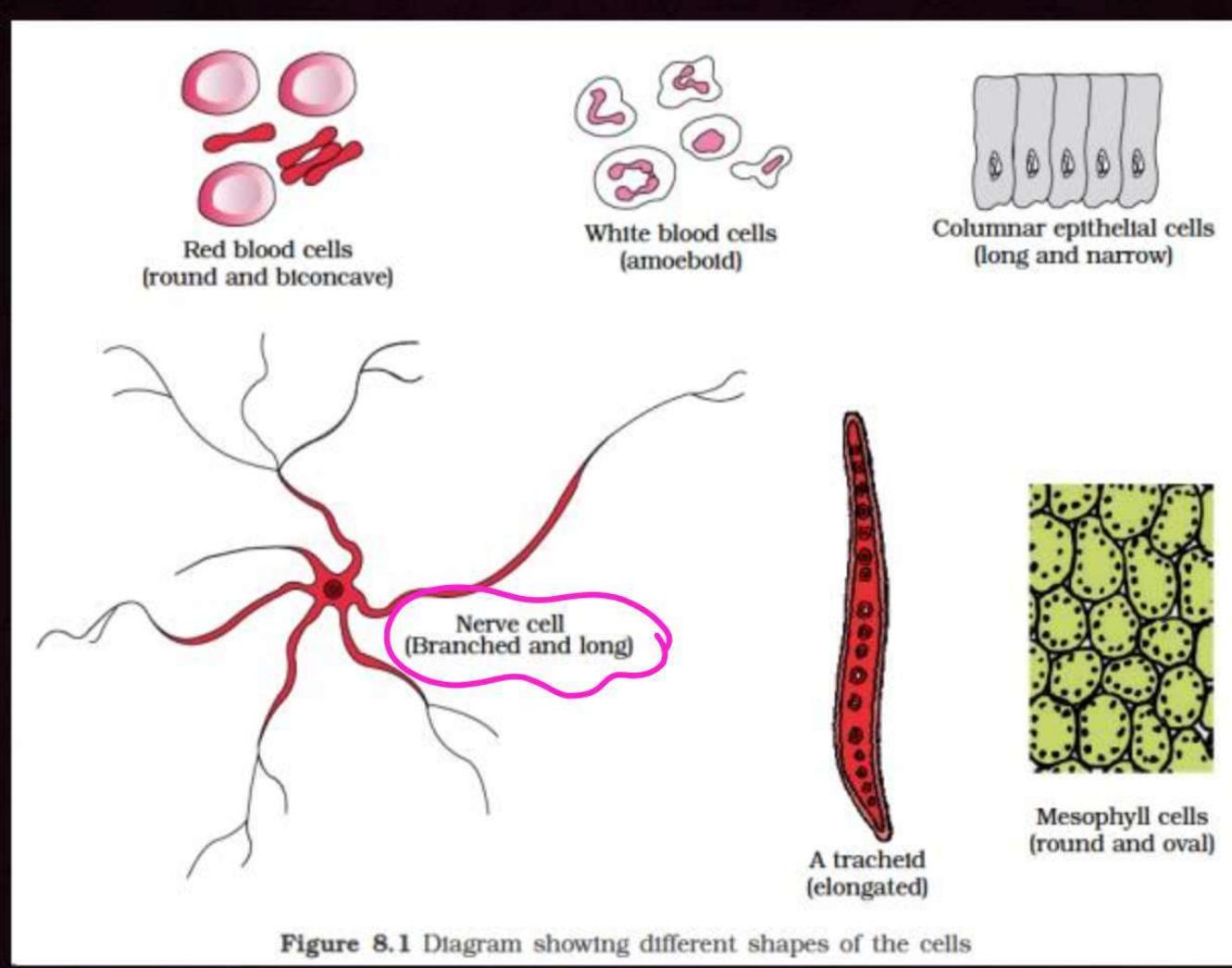
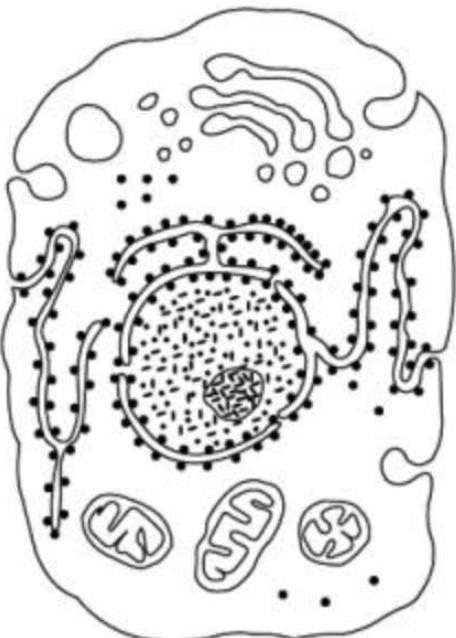
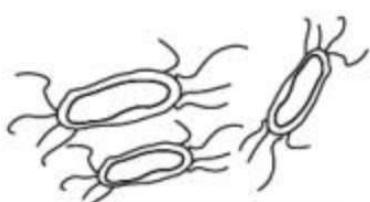


Figure 8.1 Diagram showing different shapes of the cells



A typical eukaryotic cell
(10-20 μm)



Typical bacteria
(1-2 μm)



PPLO
(about 0.1 μm)



Viruses
(0.02-0.2 μm)

NEET

Figure 8.2 Diagram showing comparison of eukaryotic cell with other organisms

7. Cytoskeleton

An elaborate network of filamentous proteinaceous structures consisting of microtubules, microfilaments and intermediate filaments present in the cytoplasm is collectively referred to as the **cytoskeleton**. The cytoskeleton in a cell are involved in many functions such as mechanical support, motility, maintenance of the shape of the cell.

TUBULIN

Actn,
myosin

NUCLEAR LAMINA (INNER
NUCLEAR
MEMBRANE)

Cilia &
flagella



11. Microbodies

Many membrane bound minute vesicles called microbodies that contain various enzymes, are present in both plant and animal cells.

QUESTION**Match List I with List II:**

(2024)

Choose the correct answer from the options given below:

- 1** A-IV, B-III, C-II, D-I
- 2** A-IV, B-II, C-III, D-I
- 3** A-II, B-IV, C-I, D-III
- 4** A-II, B-I, C-IV, D-III

	List I		List II
A.	Axoneme	i.	Centriole
B.	Cartwheel pattern	ii.	Cilia and flagella
C.	Crista	iii.	Chromosome
D.	Satellite	IV.	Mitochondria

QUESTION



(2024)

The DNA present in chloroplast is:

- 1** Linear, double stranded
- 2** Circular, double stranded
- 3** Linear, single stranded
- 4** Circular, single stranded

QUESTION

(2024)

Match List I with List II :

Choose the correct answer from the options given below:

- 1** A-IV, B-III, C-II, D-I
- 2** A-IV, B-II, C-III, D-I
- 3** A-II, B-IV, C-I, D-III
- 4** A-II, B-I, C-IV, D-III

	List-I		List-II
A.	Nucleolus	I.	Site of formation of glycolipid
B.	Centriole	II.	Organization like the cartwheel
C.	Leucoplasts	III.	Site for active ribosomal RNA synthesis
D.	Golgi apparatus	IV.	For storing nutrients

A-III
B-II
C-IV
D-I

QUESTION



Movement and accumulation of ions across a membrane against their concentration gradient can be explained by

(2023)

- 1 Facilitated Diffusion
- 2 Passive Transport
- 3 Active Transport
- 4 Osmosis

ATP

QUESTION



(2023)

How many different proteins does the ribosome consist of?

80S

- 1 60
- 2 40
- 3 20
- 4 80

QUESTION



Which of the following are NOT considered as the part of endomembrane system?(2023)

- A. Mitochondria ✓
- B. Endoplasmic reticulum
- C. Chloroplasts ✓
- D. Golgi complex
- E. Peroxisomes ✓

Choose the most appropriate answer from the options given below:

- 1 A, C and E only ✓
- 2 A and D only
- 3 A, D and E only
- 4 B and D only

QUESTION



Which of the following functions is carried out by cytoskeleton in a cell?

(2023)

- 1** Protein synthesis
- 2** Motility
- 3** Transportation
- 4** Nuclear division

QUESTION



Given below are two statements:

(2023 manipur)

Statement-I: In bacteria, the mesosomes are formed by the extensions of plasma membrane.

C

Statement-II: The mesosomes, in bacteria, help in DNA replication and cell wall formation.

C

In the light of the above statements, choose the most appropriate answer from the options given below:

- 1** Statement-I is correct but Statement-II is incorrect.
- 2** Statement-I is incorrect but Statement-II is correct.
- 3** Both Statement-I and Statement-II are correct.
- 4** Both Statement-I and Statement-II are incorrect.

QUESTION



Which of the following statements are correct with respect of Golgi apparatus?

- A. It is the important site of formation of glycoprotein and glycolipids. ✓ (2023 manipur)
- B. It produces cellular energy in the form of ATP.
- C. It modifies the protein synthesized by ribosomes on ER. ✓ glyco
- D. It facilitates the transport of ions.
- E. It provides mechanical support.

Choose the most appropriate answer from the options given below:

- 1** B and C only
- 2** A and C only
- 3** A and D only
- 4** D and E only

QUESTION

Match the List-I with List-II.

(2022)

Choose the correct answer from the options given below:

- 1** A-Q, B-P, C-S, D-R
- 2** A-S, B-R, C-Q, D-P
- 3** A-P, B-R, C-S, D-Q
- 4** A-R, B-Q, C-P, D-S

D-II
A-III
C-IY
B-I.

	List-I		List-II
A.	Metacentric chromosome	I.	Centromere situated close to the end forming one extremely short and one very long arms
B.	Acrocentric chromosome	II.	Centromere at the terminal end
C.	Submetacentric	III.	Centromere in the middle forming two equal arms of chromosomes
D.	Telocentric chromosome	IV.	Centromere slightly away from the middle forming one shorter arm and one longer arm

QUESTION



Which of the following statements with respect to Endoplasmic Reticulum is incorrect?

(2022)

- 1 SER are the sites for lipid synthesis
- 2 RER has ribosomes attached to ER
- 3 SER is devoid of ribosomes
- 4 In prokaryotes only RER are present
(ER absent)

QUESTION



Which type of substance would face difficulty to pass through the cell membrane?

2022 (Phase 2)

- 1 Substance with hydrophobic moiety
- 2 Substance with hydrophilic moiety
- 3 All substance irrespective of hydrophobic and hydrophilic moiety
- 4 Substance soluble in lipids

POLAR / WATER SOLUBLE

QUESTION



If the pH in lysosomes is increased to alkaline, what will be the outcome? 2022 (Phase 2)

- 1** Hydrolytic enzymes will function more efficiently
- 2** Hydrolytic enzymes will become inactive
- 3** Lysosomal enzymes will be released into the cytoplasm
- 4** Lysosomal enzymes will be more active

QUESTION



Which of the following is an incorrect statement?

(2021)

- 1 Microbodies are present both in plant and animal cells. (C)
- 2 The perinuclear space forms a barrier between the materials present inside the nucleus and that of the cytoplasm. (C)
- 3 Nuclear pores act as passages for proteins and RNA molecules in both directions between nucleus and cytoplasm. (C)
- 4 Mature sieve tube elements possess a conspicuous nucleus and usual cytoplasmic organelles. (Absent)

QUESTION**Match the List-I with List-II**

(2021)

Choose the correct answer from the options given below.

- 1** (A)-(I); (B)-(IV); (C)-(III); (D)-(II)
- 2** (A)-(III); (B)-(IV); (C)-(I); (D)-(II)
- 3** (A)-(II); (B)-(III); (C)-(IV); (D)-(I)
- 4** (A)-(IV); (B)-(III); (C)-(II); (D)-(I)

	List-I		List-II
A.	Cristae	I.	Primary constriction in chromosome
B.	Thylakoids	II.	Disc-shaped sacs in Golgi apparatus
C.	Centromere	III.	Infoldings in mitochondria
D.	Cisternae	IV.	Flattened membranous sacs in stroma of plastids

QUESTION



When the centromere is situated in the middle of two equal arms of chromosomes, the chromosome is referred as: (2021)

- 1** Telocentric
- 2** Sub-metacentric
- 3** Acrocentric
- 4** Metacentric

QUESTION



The organelles that are included in the **endomembrane system** are:

(2021)

- 1** Endoplasmic reticulum, Golgi complex, Lysosomes and Vacuoles.
- 2** Golgi complex, Mitochondria, Ribosomes and Lysosomes.
- 3** Golgi complex, Endoplasmic reticulum, Mitochondria and Lysosomes.
- 4** Endoplasmic reticulum, Mitochondria, Ribosomes and Lysosomes.

QUESTION



(2020)

Which of the following statements about inclusion bodies is incorrect?

- 1 These are involved in ingestion of food particles.
- 2 They lie free in the cytoplasm C
- 3 These represent reserve material in cytoplasm C
- 4 They are not bound by any membrane C

QUESTION



Which is the important site of formation of glycoproteins and glycolipids in eukaryotic cells?
(2020)

- 1 PEROXISOMES
- 2 GOLGI BODIES ✓
- 3 POLYSOMES
- 4 ENDOPLASMIC RETICULUM

QUESTION



The biosynthesis of ribosomal RNA occurs in:

(2020 Covid)

- 1** Golgi apparatus
- 2** Microbodies
- 3** Nucleolus
- 4** Ribosomes

QUESTION



Inclusion bodies of blue-green, purple and green photosynthetic bacteria are:(2020 Covid)

- 1** Gas vacuoles ✓
- 2** Centrioles
- 3** Microtubules
- 4** Contractile vacuoles

QUESTION

Match the following Lists and select the correct option;

(2020 Covid)

(A) (B) (C) (D)

- | | | | | |
|----------|-------|------|-------|-------|
| 1 | (III) | (I) | (II) | (IV) |
| 2 | (IV) | (II) | (I) | (III) |
| 3 | (I) | (II) | (III) | (IV) |
| 4 | (III) | (I) | (III) | (IV) |

	List-I		List-II
A.	Smooth Endoplasmic Reticulum	I.	Protein synthesis
B.	Rough endoplasmic reticulum	II.	Lipid synthesis
C.	Golgi complex	III.	Glycosylation
D.	Centriole	IV.	Spindle formation

QUESTION



The size of Pleuropneumonia - like Organism (PPLO) is:

(2020 Covid)

- 1** 1 - 2 μm
- 2** 10 - 20 μm
- 3** 0.1 μm
- 4** 0.02 μm

QUESTION



(2019)

Which of the following pair of organelles does not contain DNA?

- 1 Mitochondria and Lysosomes
- 2 Chloroplast and Vacuoles
- 3 Lysosomes and Vacuoles
- 4 Nuclear envelope and Mitochondria

QUESTION



The shorter and longer arms of a sub-metacentric chromosome are referred to as (2019)

- 1 s-arm and l-arm respectively
- 2 p-arm and q-arm respectively
- 3 q-arm and p-arm respectively
- 4 m-arm and n-arm respectively

QUESTION



Which of the following statements is not correct?

(2019)

- 1** Lysosomes have numerous hydrolytic enzymes.
- 2** The hydrolytic enzymes of lysosomes are active under acidic pH.
- 3** Lysosomes are membrane bound structures.
- 4** Lysosomes are formed by the process of packaging in the ~~endoplasmic reticulum~~ golgi Body.

QUESTION



The concept of "*Omnis cellula e cellula*" regarding cell division was first proposed by (2019)

- 1** Rudolf Virchow
- 2** Theodor Schwann
- 3** Schleiden
- 4** Aristotle

QUESTION

Which of the following statements regarding mitochondria is incorrect?

(2019)

- 1** Outer membrane is permeable to monomers of carbohydrates, fats and proteins.
- 2** Enzymes of electron transport are embedded in outer membrane.
INNER MEMB
- 3** Inner membrane is convoluted with infoldings.
- 4** Mitochondrial matrix contains single circular DNA molecule and ribosomes.

QUESTION



Which of the following cell organelles is present in the highest number in secretory cells?

(2019 odisha)

- 1 Mitochondria
- 2 Golgi complex
- 3 Endoplasmic reticulum
- 4 Lysosomes

① SECRETION
packaging modification
delivered.
(protein cell outside)
secretory protein

QUESTION



Non-membranous nucleoplasmic structures in nucleus are the site for active synthesis of

(2019 odisha)

- 1** protein synthesis
- 2** mRNA
- 3** rRNA
- 4** tRNA

QUESTION



prokaryote?

Which of the following nucleic acids is present in an organism having 70 S ribosomes only?

(2019 odisha)

- 1 Single stranded DNA with protein coat
- 2 Double stranded circular naked DNA
- 3 Double stranded DNA enclosed in nuclear membrane
- 4 Double stranded circular DNA with histone proteins

QUESTION

Match the List-I with List-II.

(2019 odisha)

Choose the right match from options given below:

- 1** A-R, B-S, C-Q, D-P
- 2** A-S, B-R, C-P, D-Q
- 3** A-R, B-Q, C-S, D-P
- 4** A-P, B-Q, C-S, D-R

	List-I		List-II
A.	Golgi apparatus	P.	Synthesis of protein
B.	Lysosomes products	Q.	Trap waste and excretory
C.	Vacuoles	R.	Formation of glycoproteins and glycolipids
D.	Ribosomes	S.	Digesting biomolecules

QUESTION



(2018)

Which among the following is not a prokaryote?

- 1 *Saccharomyces* (yeast) Eukaryota ✓
- 2 *Mycobacterium*
- 3 *Nostoc*
- 4 *Oscillatoria*

QUESTION

Many ribosomes may associate with a single mRNA to form multiple copies of a polypeptide simultaneously. Such strings of ribosomes are termed as

(2018)

- 1** Polysome ✓
- 2** Polyhedral bodies
- 3** Plastidome
- 4** Nucleosome

QUESTION



(2018)

The Golgi complex participates in

- 1 Fatty acid breakdown
- 2 Formation of secretory vesicles
- 3 Respiration in bacteria
- 4 Activation of amino acid

QUESTION



Which of the following events does not occur in **rough endoplasmic reticulum?** (2018)

1 Protein folding

2 Protein glycosylation

3 Cleavage of signal peptide

4 Phospholipid synthesis

SER

QUESTION



(2018)

Which of the following is true for nucleolus?

- 1** Larger nucleoli are present in dividing cells.
- 2** It is a membrane-bound structure.
- 3** It takes part in spindle formation.
- 4** It is a site for active ribosomal RNA synthesis

QUESTION



Which of the following components provides sticky character to the bacterial cell?

[OS] (2017-Delhi)

- 1 Cell wall
- 2 Nuclear membrane
- 3 Plasma membrane
- 4 Glycocalyx

QUESTION



Which of the following cell organelles is responsible for extracting energy from carbohydrates to form ATP?

(2017-Delhi)

- 1** Lysosome
- 2** Ribosome
- 3** Chloroplast
- 4** Mitochondrion

QUESTION



A complex of ribosomes attached to a single strand of RNA is known:

(2016 - I)

- 1** Polysome
- 2** Polymer
- 3** Polypeptide
- 4** Okazaki fragment

QUESTION



Mitochondria and chloroplast are

- A. Semi-autonomous organelles
- B. Formed by division of pre-existing organelles and they contain DNA but lack protein synthesizing machinery

Which one of the following options is correct?

(2016-I)

- 1** Both (A) and (B) are correct
- 2** (B) is true but (A) is false
- 3** (A) is true but (B) is false
- 4** Both (A) and (B) are false

QUESTION



Microtubules are the constituents of:

(2016-I)

- 1** Cilia, Flagella and Peroxisomes
- 2** Spindle fibres, Centrioles and Cilia
- 3** Centrioles, Spindle fibres and Chromatin
- 4** Centrosome, Nucleosome and Centrioles

QUESTION



Select the wrong statement:

(2016 - II)

- 1** Cyanobacteria lack flagellated cells.
- 2** Mycoplasma is a wall-less microorganism
- 3** Bacterial cell wall is made up of peptidoglycan.
- 4** Pili and fimbriae are mainly involved in motility of bacterial cells

QUESTION



(2016 - II)

Select the mismatch:

- 1** Protists-Eukaryotes
- 2** Methanogens-Prokaryotes
- 3** Gas vacuoles-Green bacteria
- 4** Large central vacuoles-Animal cells

QUESTION



A cell organelle containing hydrolytic enzymes is:

(2016 - II)

- 1** Ribosome
- 2** Mesosome
- 3** Lysosome
- 4** Microsome