



ARJUNA NEET BATCH

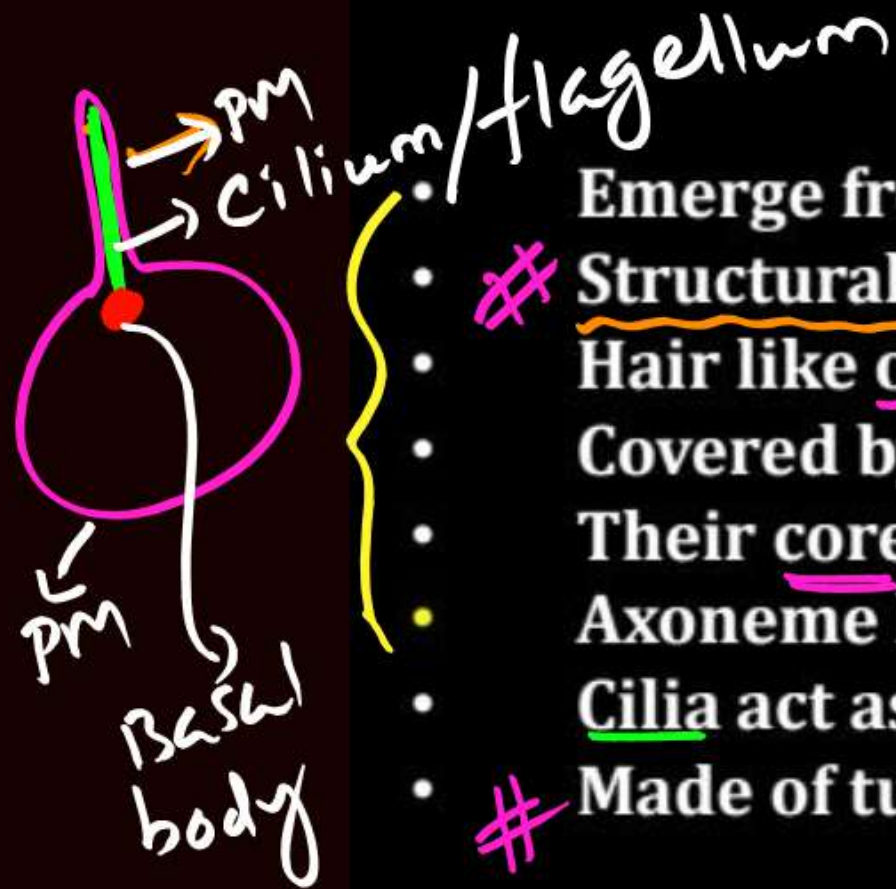


CELL THE UNIT OF LIFE

By : Biswajit Sir

Cilia, Flagella (Sing: Cilium, flagellum)

↳ Surface appendages



- Emerge from basal body.
- Structurally similar ↳ modified centriole.
- Hair like outgrowths of PM.
- Covered by PM (e-microscope)
- Their core is called axoneme. Imp.
- Axoneme has 9 + 2 MT organization
- Cilia act as oars. #
- # Made of tubulins protein + nexin protein + dynein protein.

lipase
protease
ATP → ADP + P_i

↓ has

ATPase activity

central
peripheral
2 + 2 MT org.

Cilia → EK cells

Flagella → PK cells, EK cells.



Features of Cilia, Flagella

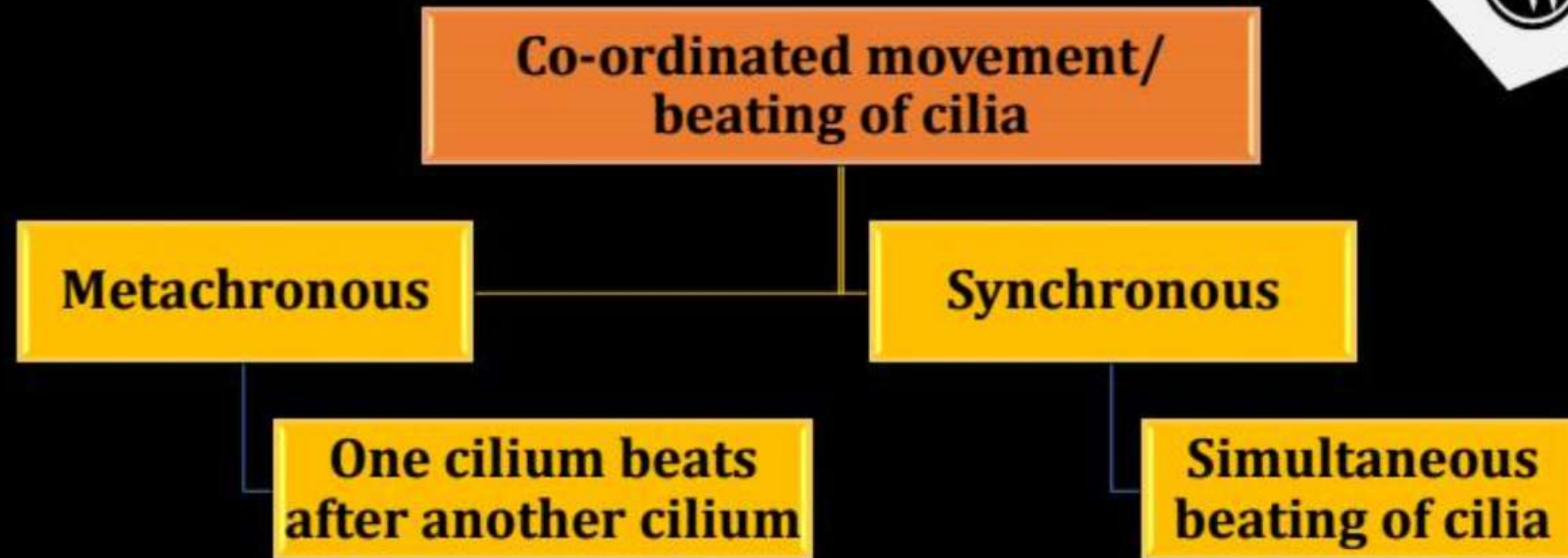


Features	Cilia	Flagella
Occurrences	EK	PK,EK
Size	relatively shorter (Smaller)	relatively (larger)
Number	Usually numerous	Usually few
Distribution	Usually through out body surface.	Usually of one end called apical end,
Cause movement of	Cell or surrounding fluid.	Cell
Type of movement	<ul style="list-style-type: none">▪ Sweeping or rowing▪ Co-ordinated	<ul style="list-style-type: none">▪ Undulatory (Wave like)▪ Independent
Function	Locomotion, feeding, Circulation	Locomotion



#



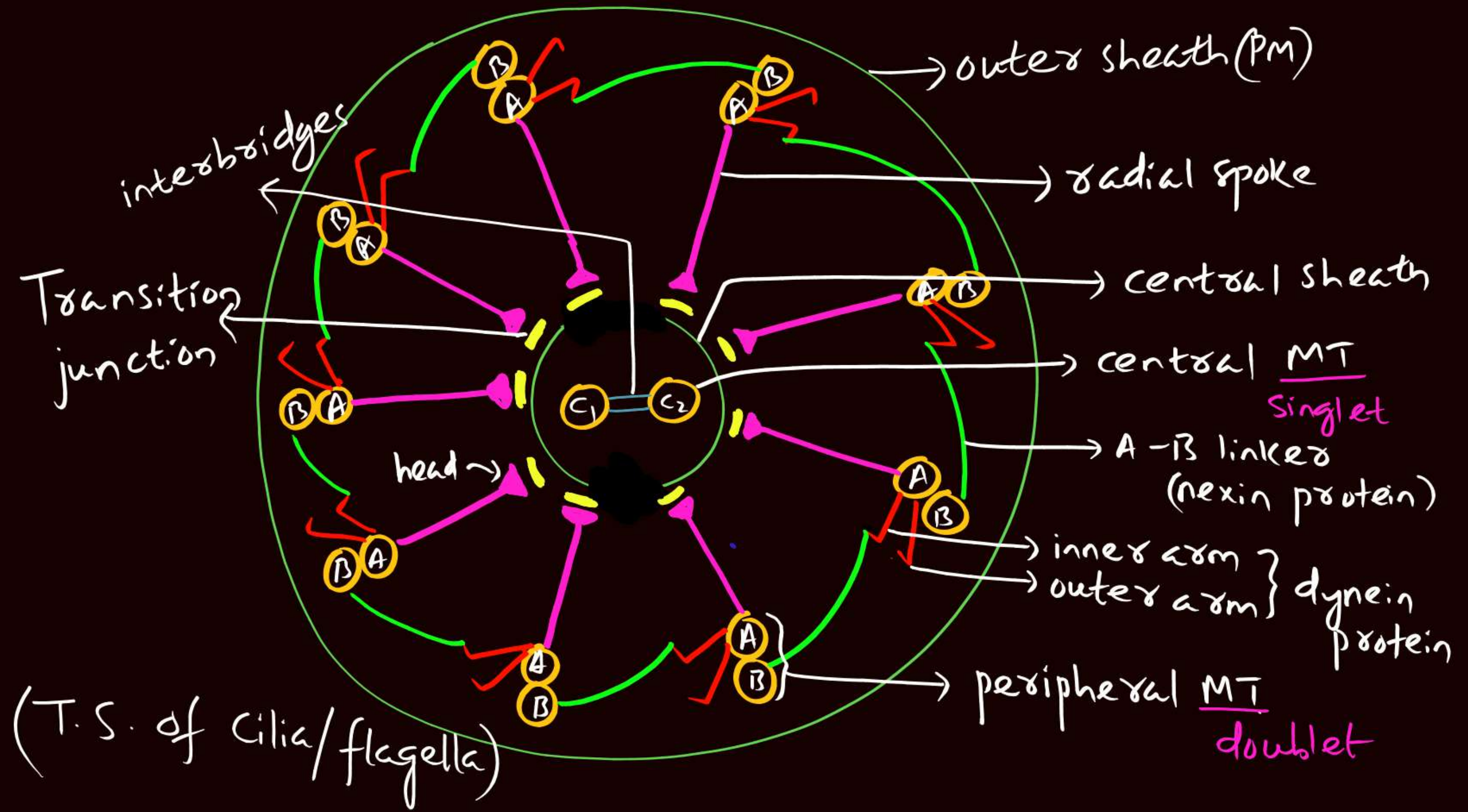


Note:-

PK and EK flagella are structurally and functionally different.

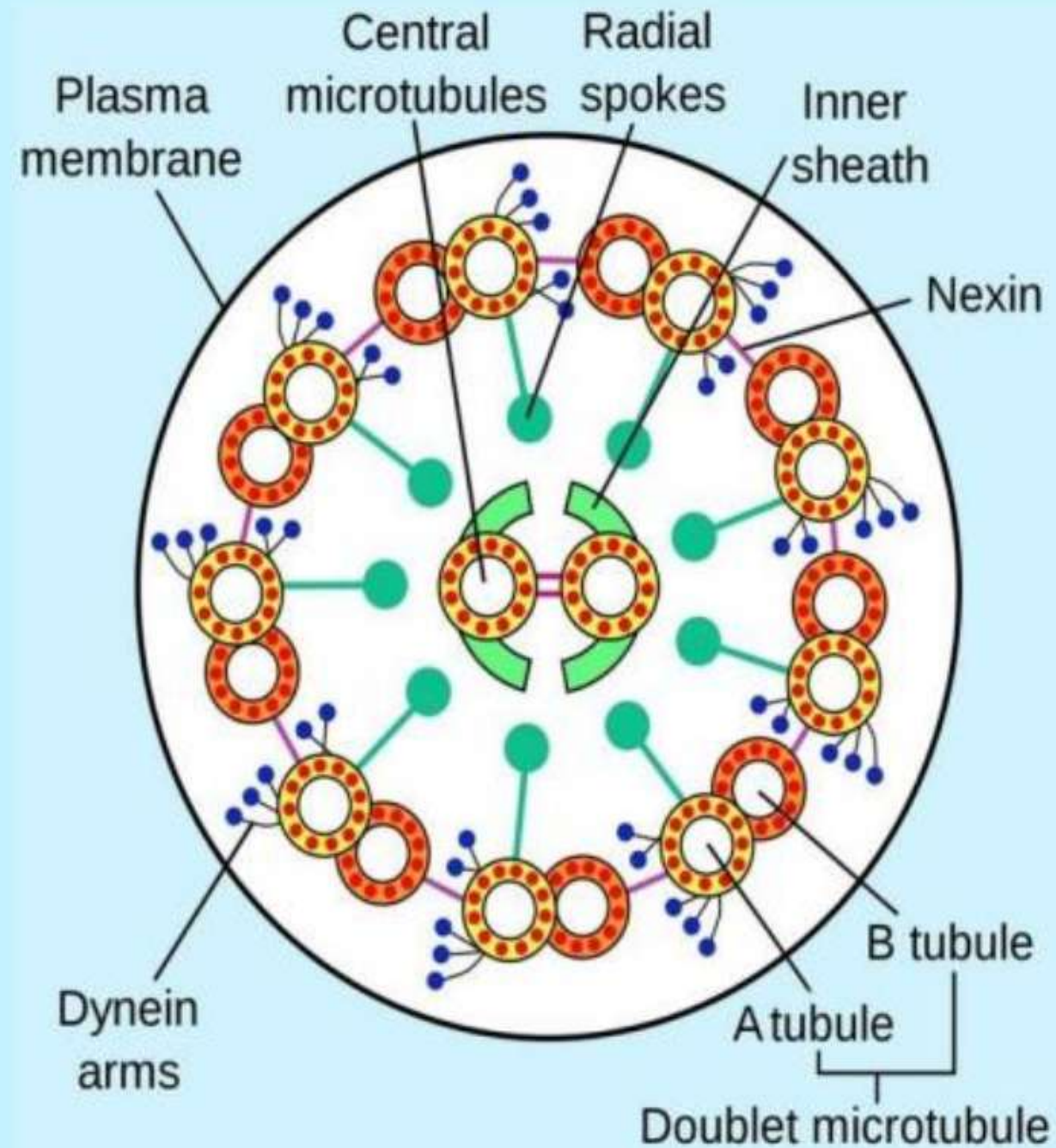


type of movement

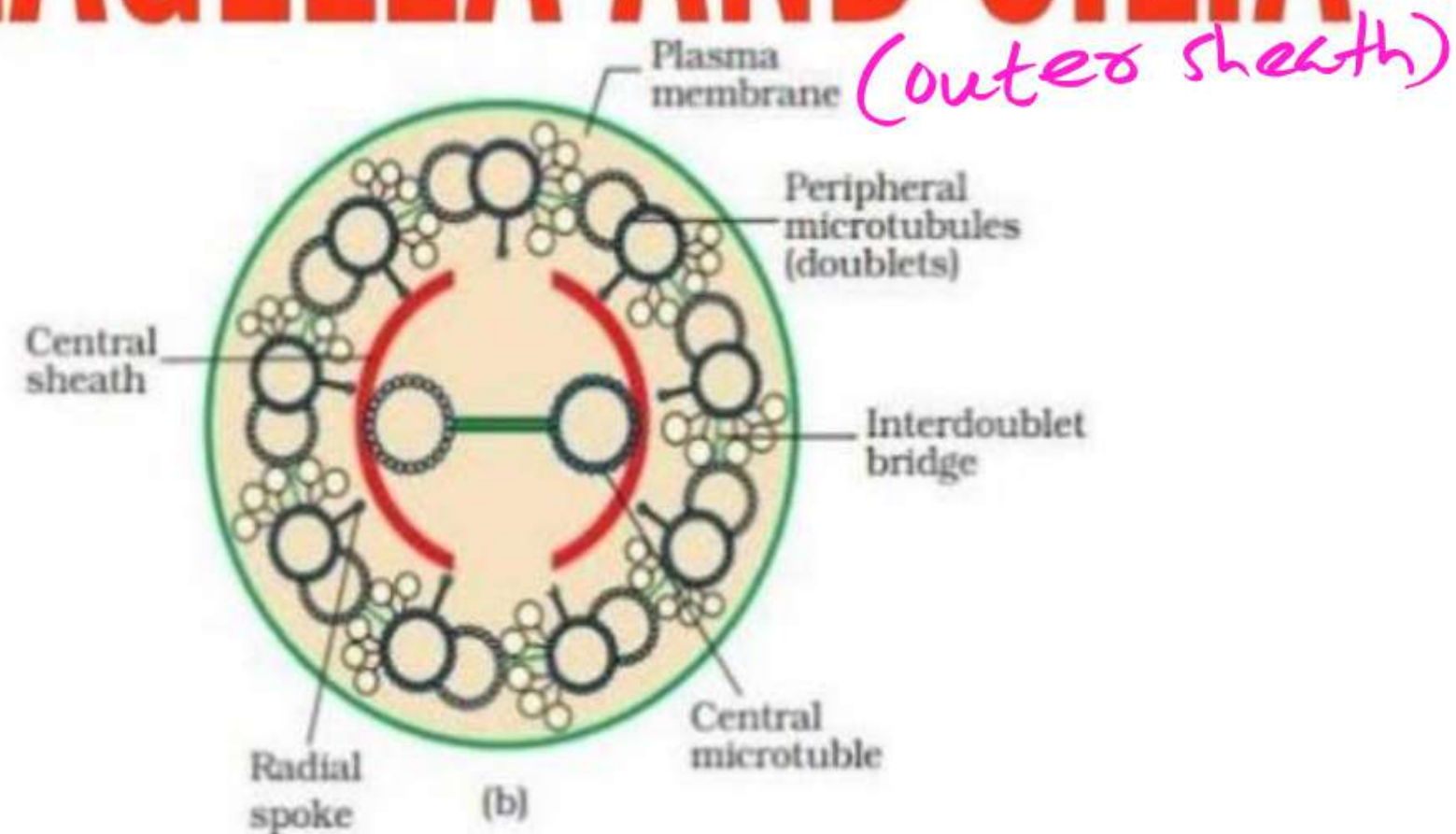


CILIA AND FLAGELLA

SIMPLIFIED BIOLOGY



FLAGELLA AND CILIA



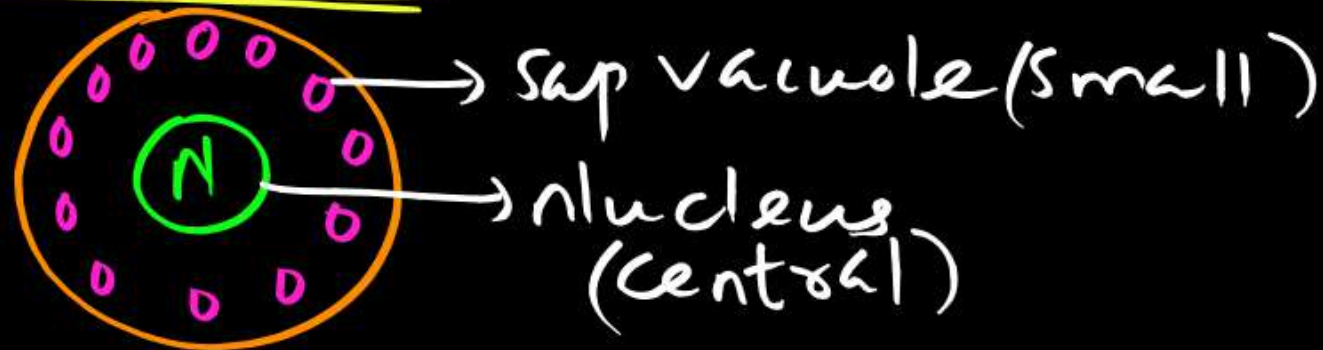
for NEET AIMS JIPMER

Nucleus

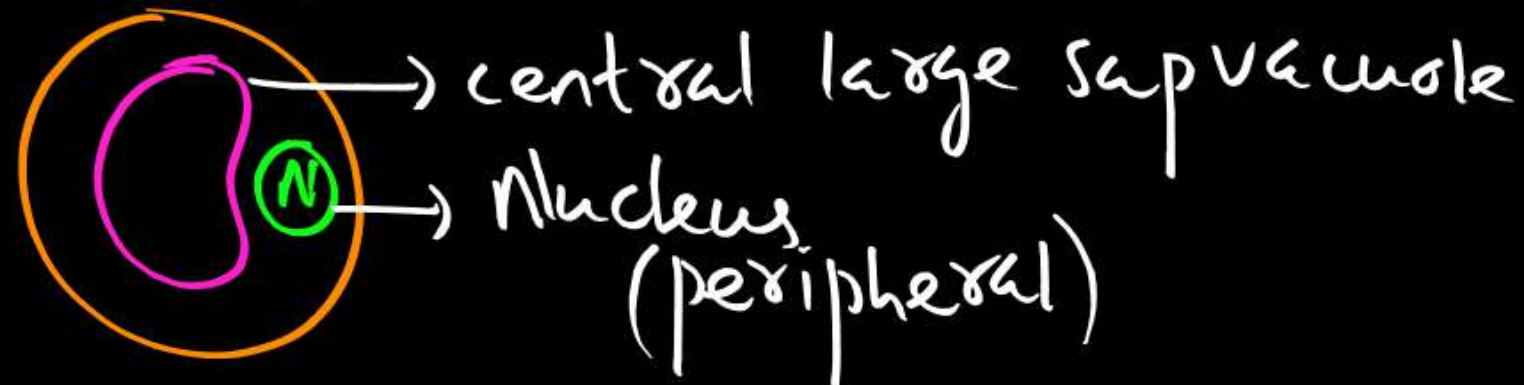
- Master organelle, non-cytoplasmic or extra cytoplasmic organelle.
- # • Discovery – Robert Brown (1831) from root cell of orchid.
- Double membrane bound.
- Noncytoplasmic/ extracytoplasmic organelle

- Position:- Metabolically active centre of cell.

(a) Animal cell or immature plant cell – Centre of cell



(b) Mature plant cell – Periphery of cell.



Number of Nucleus per cell

- 0 - Enucleated cell - Mature mammalian RBC, Mature sieve tube cell.
- 1 - Uninucleated cell - Common ↳ exception → Camel, Lemna
- 2 - Binucleated cell - *Paramecium caudatum*
- 3 - Trinucleated cell - *Paramecium aurelia*

(>3) - Many - Multinucleated cell

Coenocytic

Syncytium

Fungi,
Plants

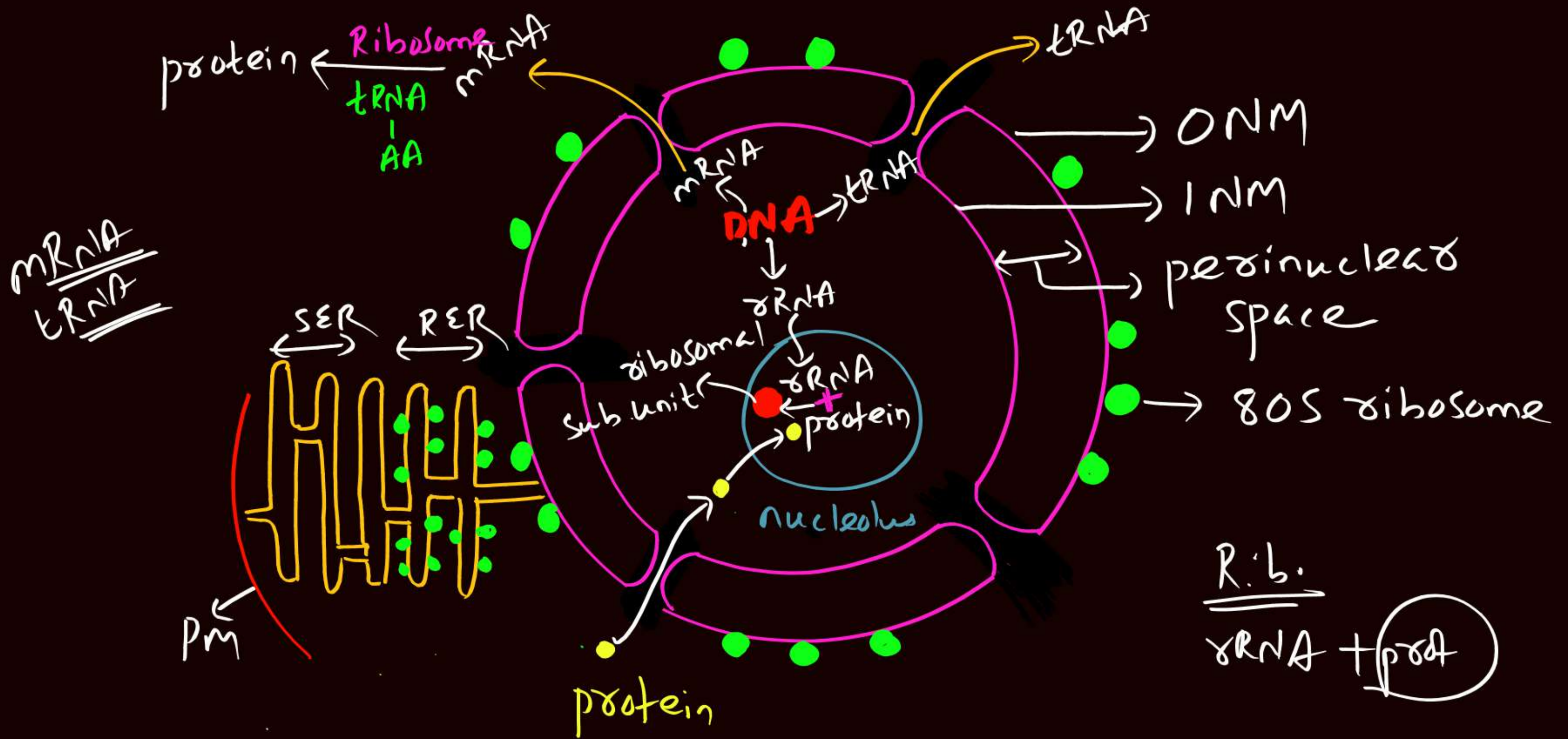
Animals



Ultrastructure of interphasic Nucleus

Nucleus consists of

- (a) Nuclear envelope**
- (b) Nuclear matrix (nucleoplasm)**
- (c) Chromatin**
- (d) Nucleolus**



Nuclear Envelope

- Forms barrier between materials in cytoplasm
- Nuclear envelope consists of

1. ONM + 2. INM + 3. perinuclear space

Space between 0 NM, 1 NM
10- 50 nm (diameter)

INM, ONM - Parallel.

ONM	INM
May be smooth or rough (due to 80s ribosome)	Always smooth
Often associated with RER	Never associated with RER

Nuclear envelope is interrupted by

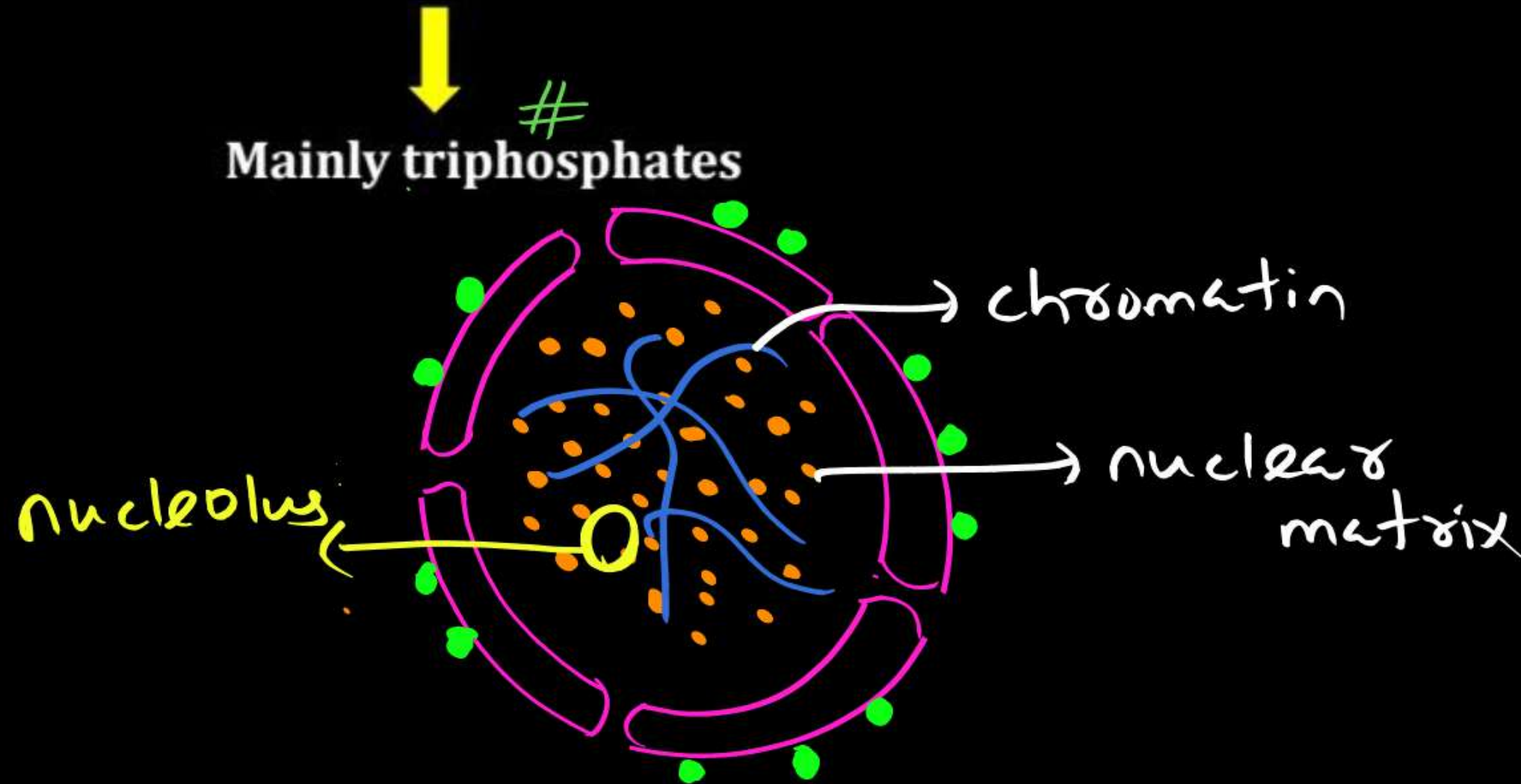
Nuclear pores :-

- (a) Minute
- (b) 300 Å - 1000 Å diameter
- (c) Present at a no. of places
- (d) Formed due to fusion of ONM, INM
- # (e) Allows transport of proteins and RNA in both direction

↓
tRNA
mRNA

Nuclear matrix

- (a) Known as nucleoplasm
- (b) Semifluid, transparent, colloidal substance that fills nucleus.
- (c) Has nucleolus and chromatin.
- (d) Contains enzymes, nucleotides, nucleosides, minerals etc.





nucleoside
↑
phosphate

nucleotide

NB + S + P

nucleoside

Nucleic Acid

nucleotide

Nitrogenous
base
(NB)

Sugar

phosphate
1/2/3