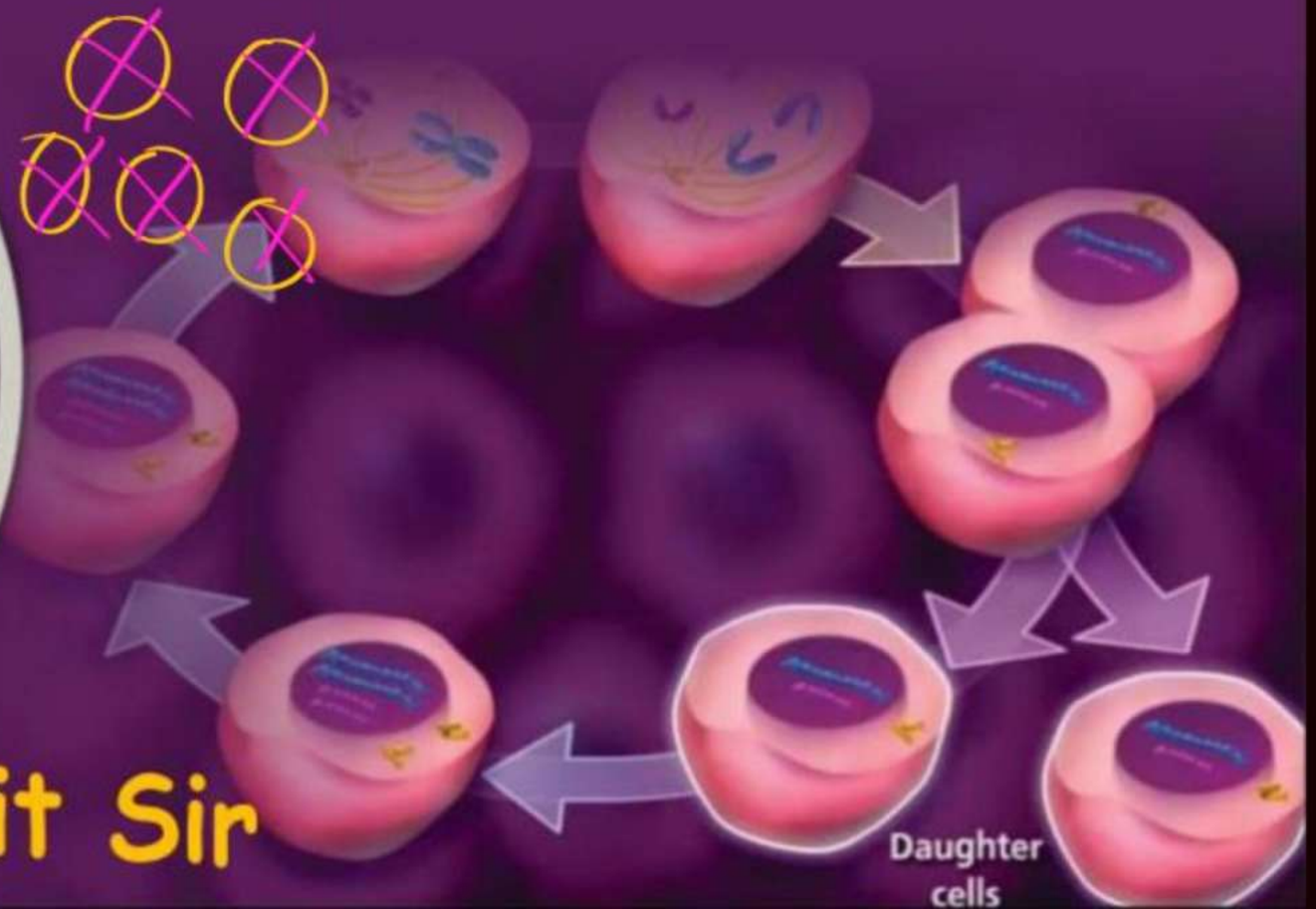
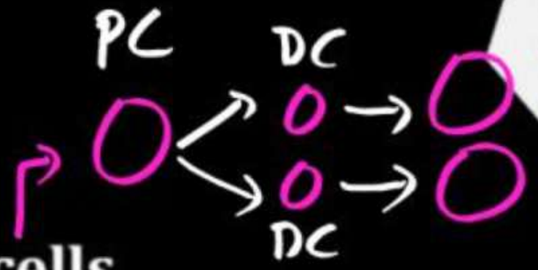
ARJUNA NEET BATCH

CELL CYCLE AND CELL DIVISION

By : Biswajit Sir

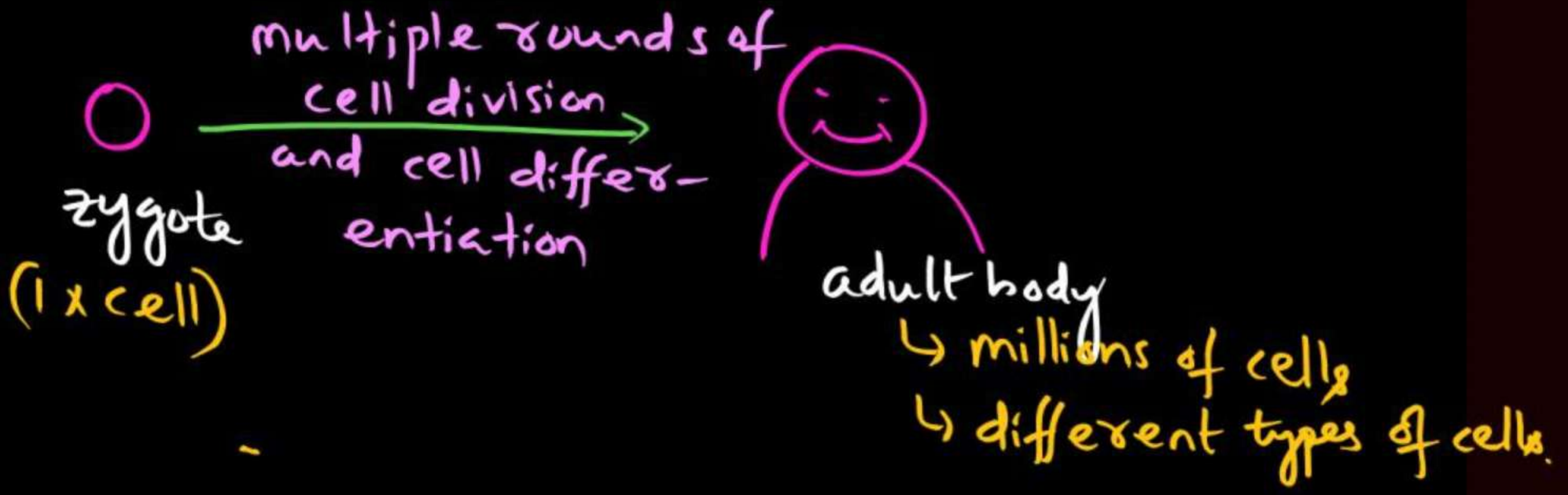


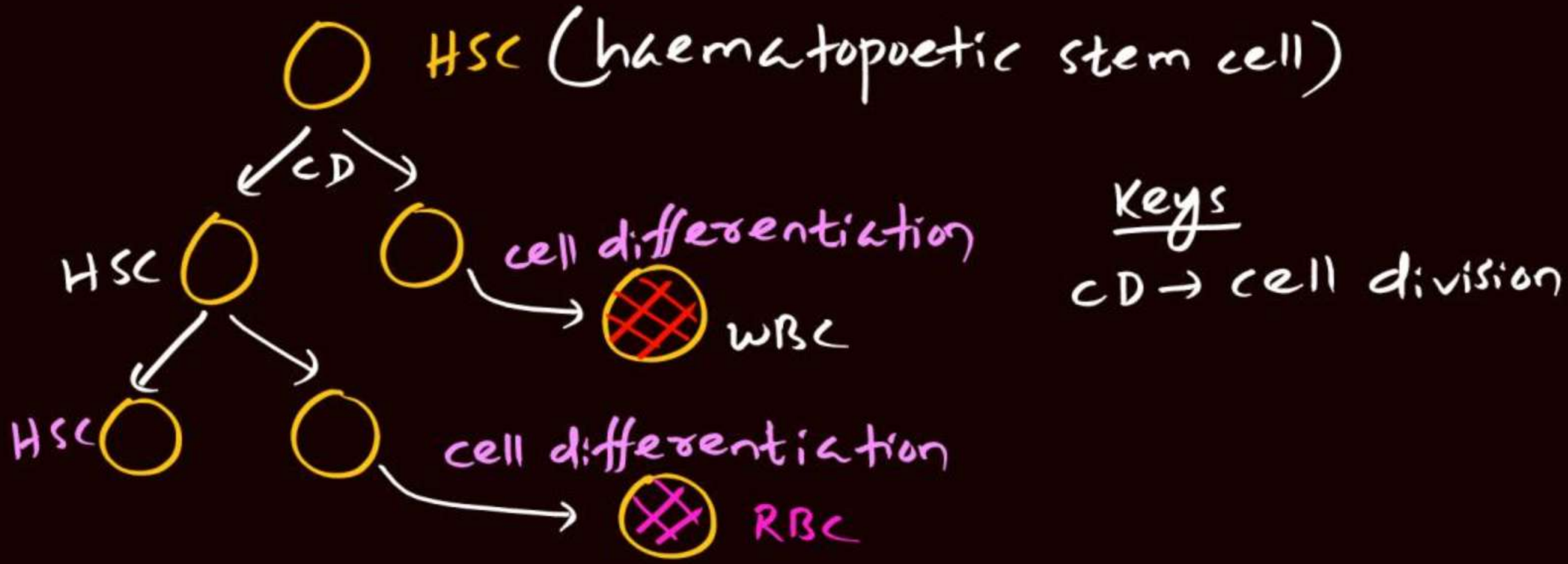


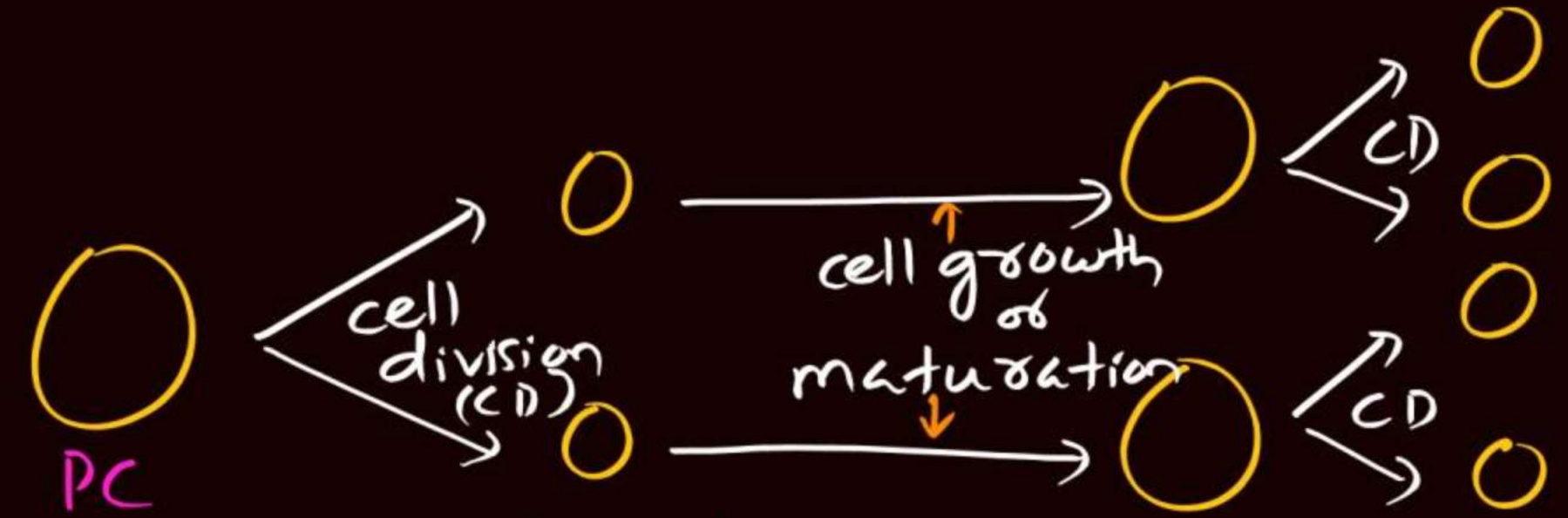
Growth, reproduction

Characteristic of organism indeed of cells.

All organism (sexually reproducing) start their life with a single cell called zygote.




HSC (haematopoetic stem cell)
CD
HSC
cell differentiation
WBC
HSC
cell differentiation
RBC
Keys
CD → cell division



* multiple cells
* different types of cells

Cell division → very important process for all living organisms → without cell division organisms can't grow, not reproduce.

Known as ←

(1) K/as cell multiplication, cell reproduction.

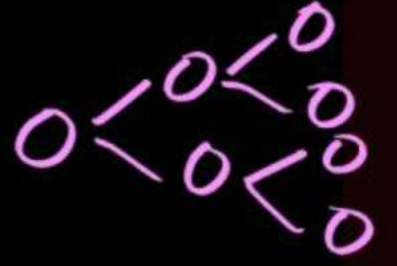
(2) Includes DNA replication + cell growth.

DNA replication:-

(i) called genome duplication

(ii) occurs in S phase only, hence, discontinuous

Imp. Imp.



Cell growth:-

w.r.t cytoplasm

(i) It occurs throughout cell cycle, hence, continuous.

(ii) Increase in cellular components.

↳ cell organelles, RNA, proteins, etc

Genome

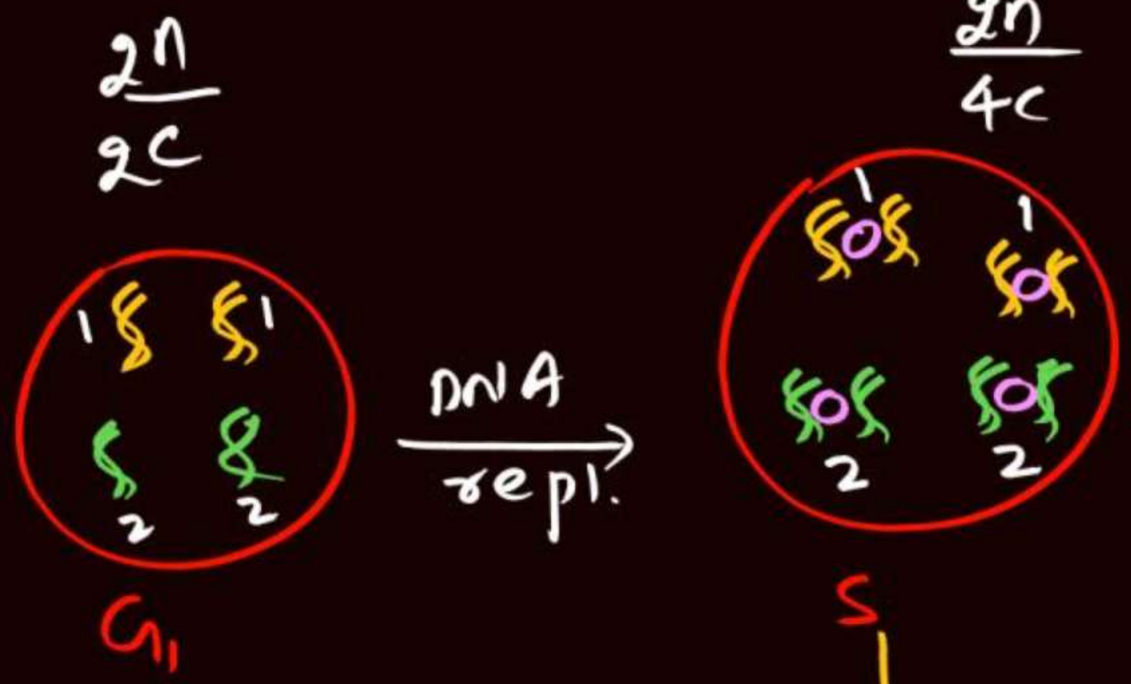
↓

total DNA present in haploid set of chromosomes.

↓

number of chromosomes present in gamete.

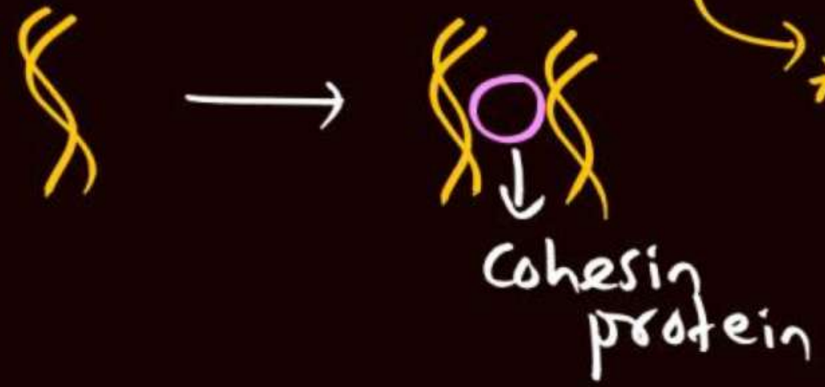
gamete → $\frac{n}{2}$



genome
↓
DNA
↓
c

n → no. of chromosome

c → amount of DNA



* no. of chromatin (chromosome) does not change.

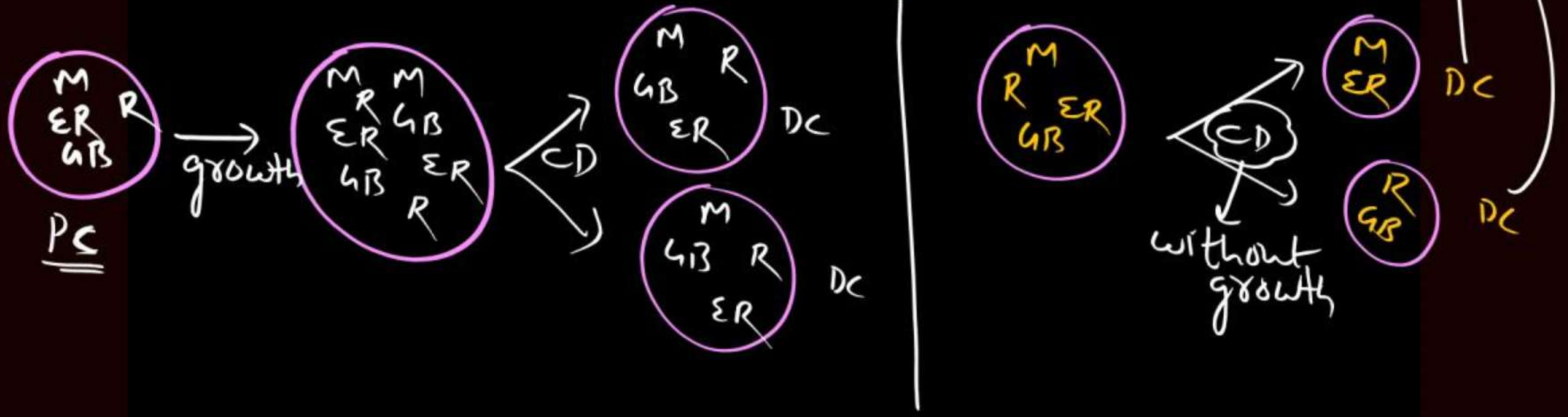
* amount of DNA becomes double

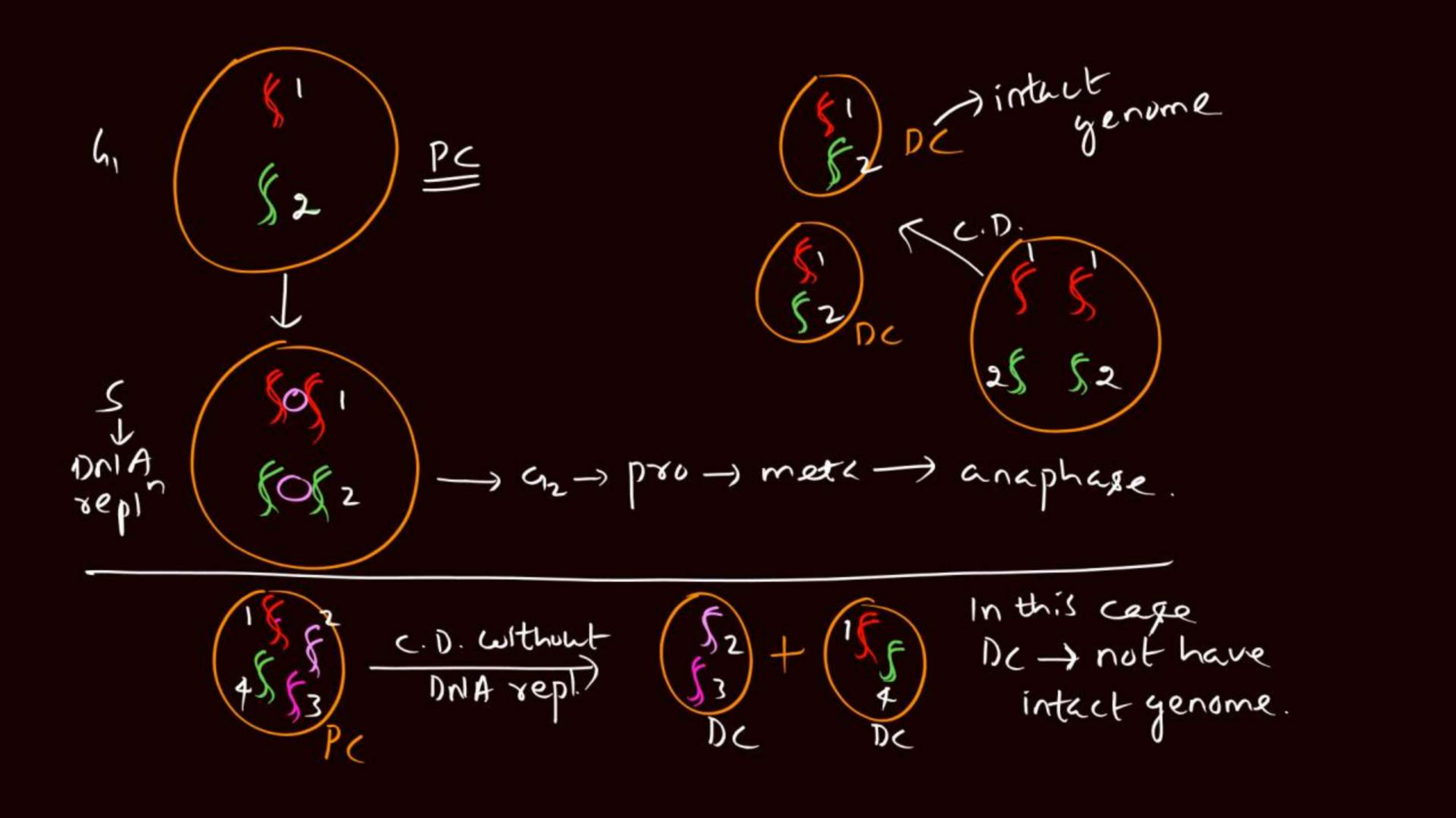
(3) Cell division, DNA replication , cell growth.

Occur in a co-ordinated manner

Result

correct cell division + formation of DCs with intact genome.




G_1
PC
DC
intact genome
C.D.
DC
S
DNA repl^n
G_2 → pro → meta → anaphase.
PC
C.D. without DNA repl.
DC
DC
In this case DC → not have intact genome.

Ek Cell Cycle

- Sequence of event by which cell duplicates its genome, cellular component and eventually divides.
- Sequence of events from one cell division to next.
- # Genetically controlled
- # Irreversible
- # Energy (ATP) dependent
- Duration:-
  - (a) Species specific
  - (b) Cell specific (depends on cell type)

PK cell

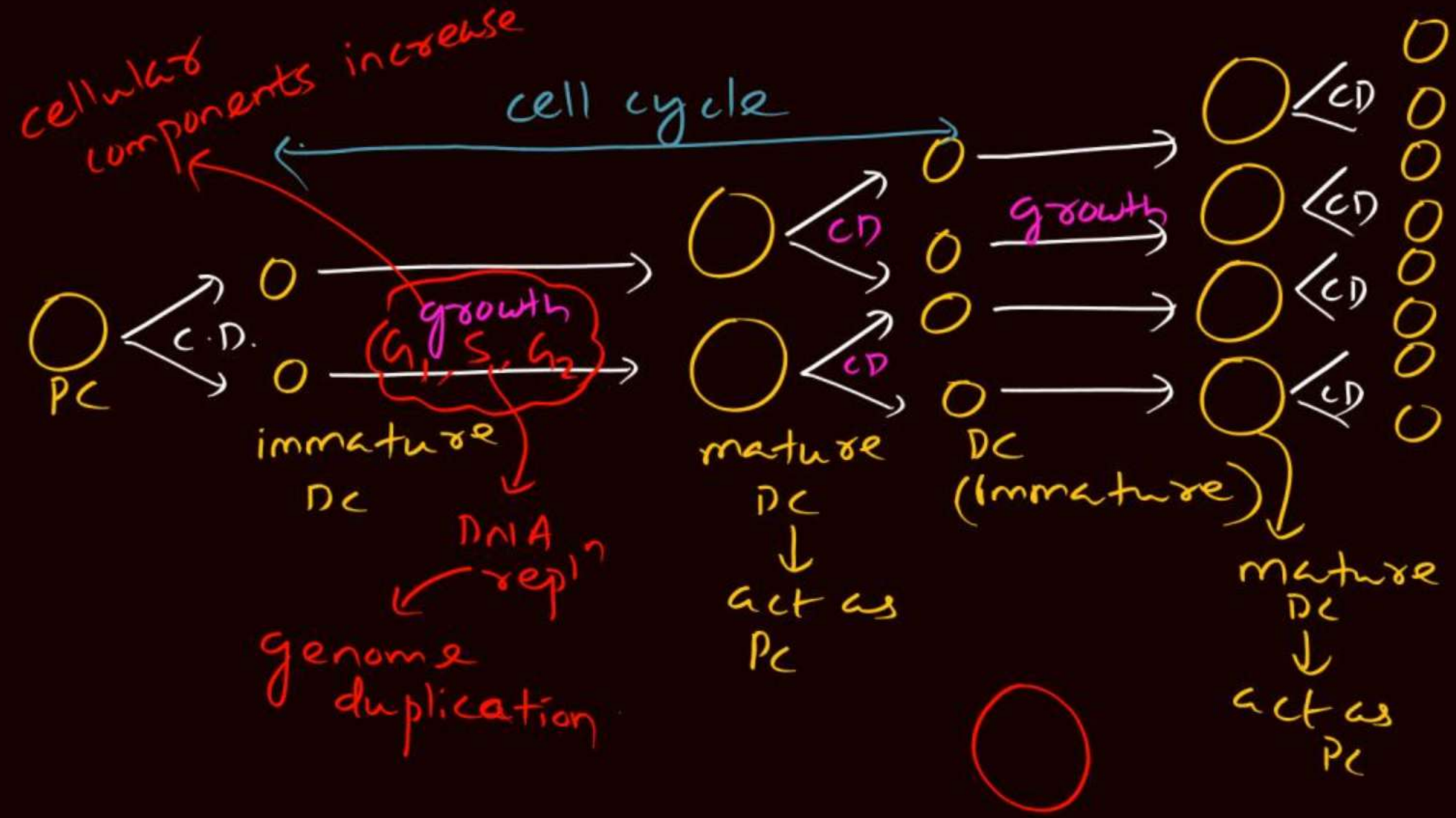
E-coli - 20 min

Yeast - 90 min

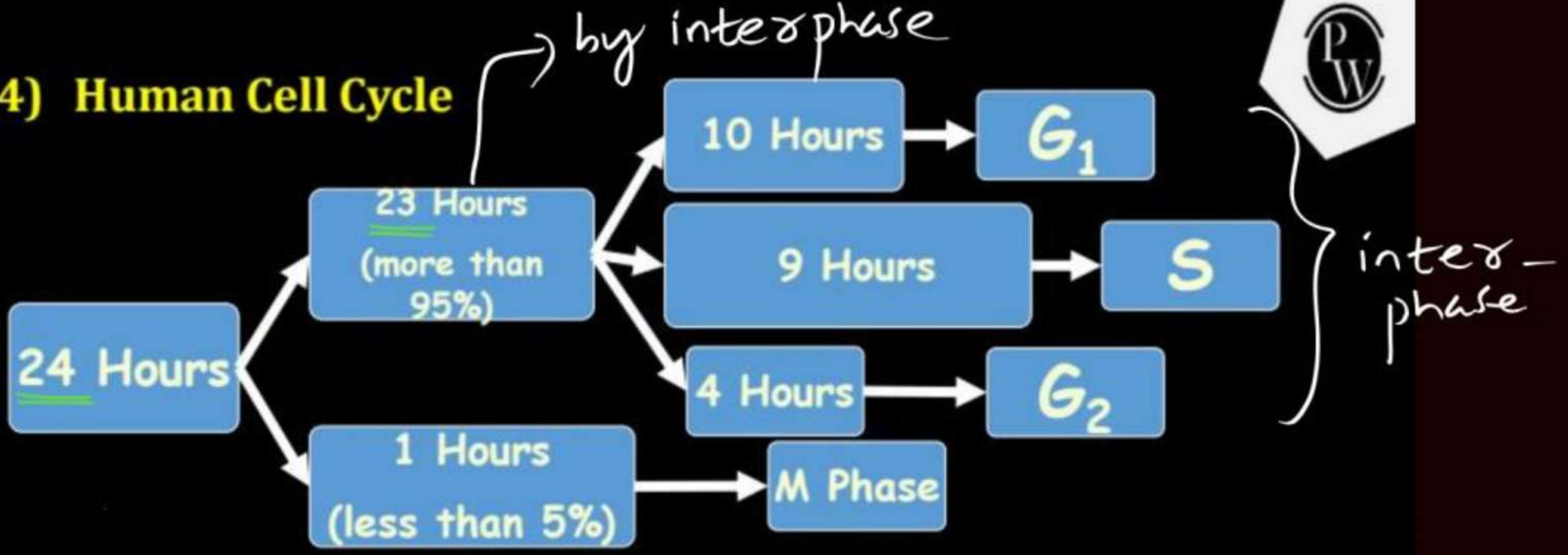
Human Cell (in culture) - 24 hours

↳ Same individual k alag alag cells divide krne k liye alag alag time require krte hain.

- Regulated by Cyclin, CDK. (Cyclin Dependent Kinase)


cellular components increase
cell cycle
growth
C.D.
PC
immature DC
DNA repln
genome duplication
mature DC
act as PC
growth
DC (Immature)
mature DC
act as PC

(4) Human Cell Cycle



The decreasing order of duration of various phases of cell cycle –

G_1 > S > G_2 > Prophase > metaphase > telophase > Anaphase.

THANK YOU