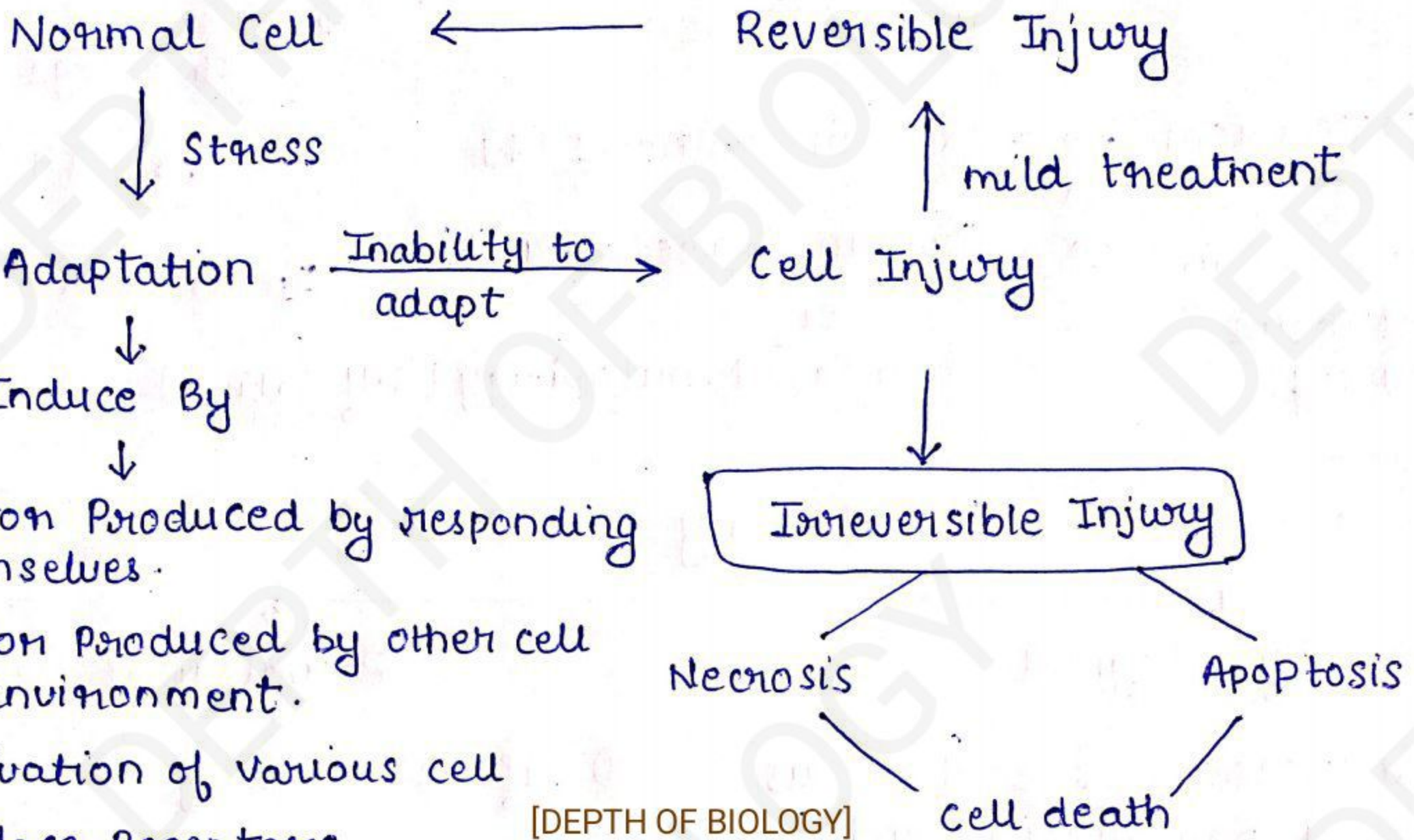
CELL INJURY Adaption



- Factor Produced by responding themselves.
- Factor Produced by other cell in environment.
- Activation of various cell
- Surface Receptors

Cellular Adaptation →

- New steady altered State.
- Allow them to survive
- Continue to function
- In abnormal Environment

4 types of Adaptation

Atrophy → Adaptive change

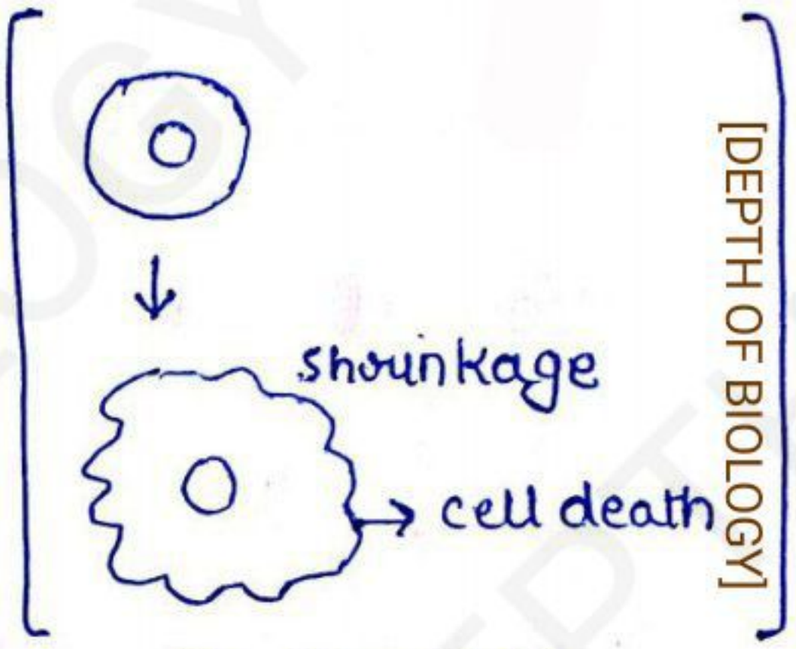
Hypertrophy

Hyperplasia

Metaplasia

@ Atrophy → No. of Cell [↓]se
or
Cell Size [↓]se

Mechanism → Protein Synthesis [↓]
↓ Leads to → Protein degredation [↑]
decrease in metabolic activity
or
Increased Autophagy [Self Eating]



Atrophy

Physiological

① Increase in size of uterus after parturation and after menopause

② Brain (with ageing)
Size of Brain [↓]se

③ Pressure Atrophy → Tissue compression for long time
If we have tumor the other adjustment cell pr ye pressure lagayega uski vajah se size [↓]

Pathological

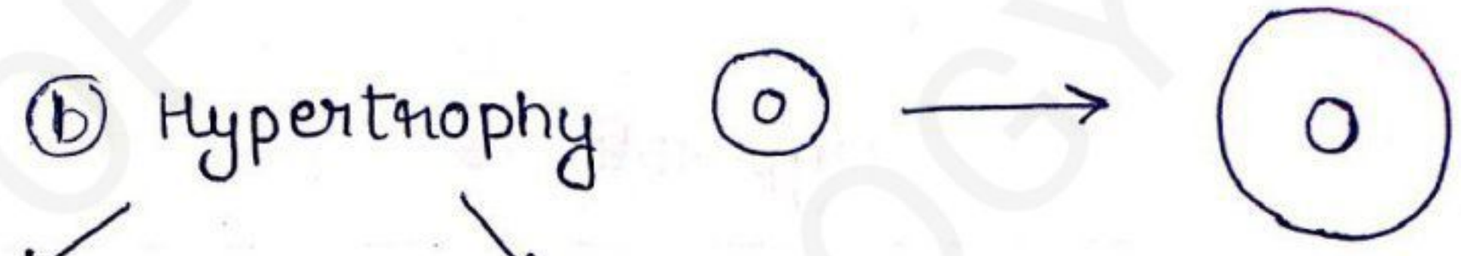
① Difuse Atrophy
↳ organ / Part कम उसका Size Reduce Like ⇒ Polio ho jana

② Nutritional / Starvation Atrophy
↙ Body Part Shrink
↘ Seen in Cancer or malnutrion

④ Ischaemic Atrophy → Hand में [↓] blood Supply → So cell Shrink

⑤ Endocrine Atrophy [DEPTH OF BIOLOGY]
↓
Loss of Endocrine stimulation leads to [↓]se metabolic activity of tissue.

(b) Hypertrophy



[↑]se in the size of Parenchymal cell → Lead to [↑]se in the size of the organs

no. of cell same — only size[↑]

[DEPTH OF BIOLOGY]

Causes

① [↑] functional demand

② Stimulation by Hormone and Growth factor

③ [↑]se Production of Cellular Protein

Hypertrophy

Physiological Hypertrophy

① Enlarged size of uterus in Pregnancy.

② Hypertrophy of breast during lactation due to protein and oestrogen.

③ Skeletal Muscle Hypertrophy in body builders.

Pathological Hypertrophy

① Cardiac Muscle Hypertrophy
→ Pressure load in dx. like Hypertension
→ Volume load.

② Increased of Enlarged Prestate smooth Muscle Hypertrophy of the bladder wall is seen due to increase resistance to out flow.

[DEPTH OF BIOLOGY]

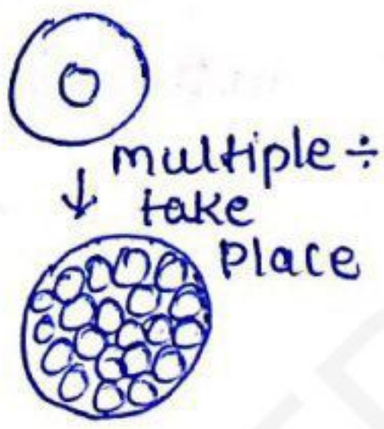
© Hyperplasia → usually occur after response to astimuli.

→ [↑] in the no. of cell in organ / tissue

↳ usually resulting in [↑]sed Volume.

↓ cell remain same size but [↑] in no.

↳ [↑]se in no. due to [↑]se in demand.



[DEPTH OF BIOLOGY]

Hyperplasia

Physiological

- Hormonal
- Female Breast [In Puberty and Lactation]
- Endometrium [Proliferation Phase of Cycle]
- Hyperplasia of Pregnant uterus

Pathological

ⓐ Prostate gland (with ageing)

ⓑ Endometrium [Hormone Producing ovarial tumours]

ⓒ Adrenal gland (in Pitutary tumours)

ⓓ Parenchymal organ in Geromegal.

ⓔ Formation of skin warts or lessions (Hyperphasia of epidermis) due to papilloma virus.

ⓓ **Metaplasia (change the type of cell)**

↓

A reversible change in cell structure from one fully differentiated from to another in response to normal or abnormal stimuli.

Types

Physiological

- A Normal type of cell Maturation.

Pathological

- A Change due to abnormal Stimuli.

[Function change]
eg → Sq. to column under the influence of Gastric acid reflex.

Example of Physiological Metaplasia →
Metaplasia of the endocervix [Columnar epithelium into squamous epithelium]

Example of Pathological Metaplasia →

Respiratory epithelium in smokers [Ciliated Columnar epithelium to squamous epithelium]

[DEPTH OF BIOLOGY]

© Dysplasia → ⊙ → ⊙ → ⊙ → ⊙
(Normal) ⊙ → ⊙ → ⊙ → ⊙

The presence of cell of an abnormal type within a tissue which may signify a stage preceding the development of Cancer.

[DEPTH OF BIOLOGY]

Apoptoti Gene → activate → Cell death

But due to Carcinogic Subst. mutation takes place → Escape apoptosis ↓ and Persists to become a tumour cell or atypical cell.

Lueoplakia — Erythroplakia

Epithelial Cell
↓ Tobacco
Tumour cell

[DEPTH OF BIOLOGY]

[Loss of its Architecture] and Here I↑Ise in mitotic activity
[↑]se neuclocytoplasmic ratio

Morphological Change in Dysplasia :-

① [↑]se in no. of layer of epithelial cell

② Cellular and nuclear pleomorphism

③ Loss of Basal Polarity

④ Nuclear hype chromatism

Hyperplastic Epithelium

→ Cell in this phase are only reversible damage i.e. they could reverse into normal when irritance are removed.

Irritance

↓

Persistance

↓

and mutation takes place in cell.