* MORPHOLOGY OF CELL INJURY

For Class- B.Pharmacy 2nd Semester

Subject- Pathophysiology (BP204T)

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Introduction

The cell is the highly structured complex of molecules and organelles that are arranged to full fill the routine meatbolic housekeeping and the specialized functions that make one cell different from another. It can be divide in to three patterns-

* Patterns of cell injury i.e. reversible and irreversible leading to necrosis or apoptosis.
* Subcellular alteration
* Intracellular accumulation of the number of substances like lipids, carbohydrates etc.

Cellular adaptive changes

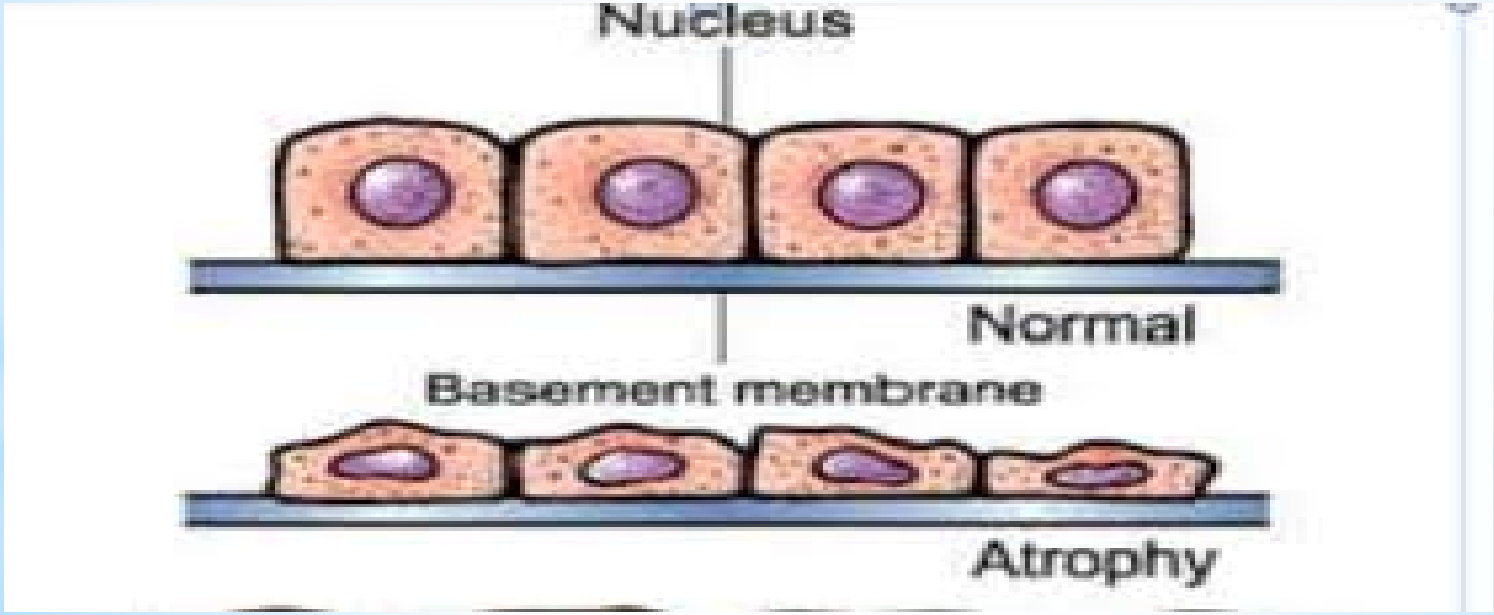
Cellular **adaptation** refers to **changes** made by a cell in response to adverse or varying environmental **changes**. The **adaptation** may be physiologic (normal) or pathologic (abnormal).

It includes-

* Atrophy
* Hypertrophy
* Hyperplasia
* Metaplasia
* Dysplasia

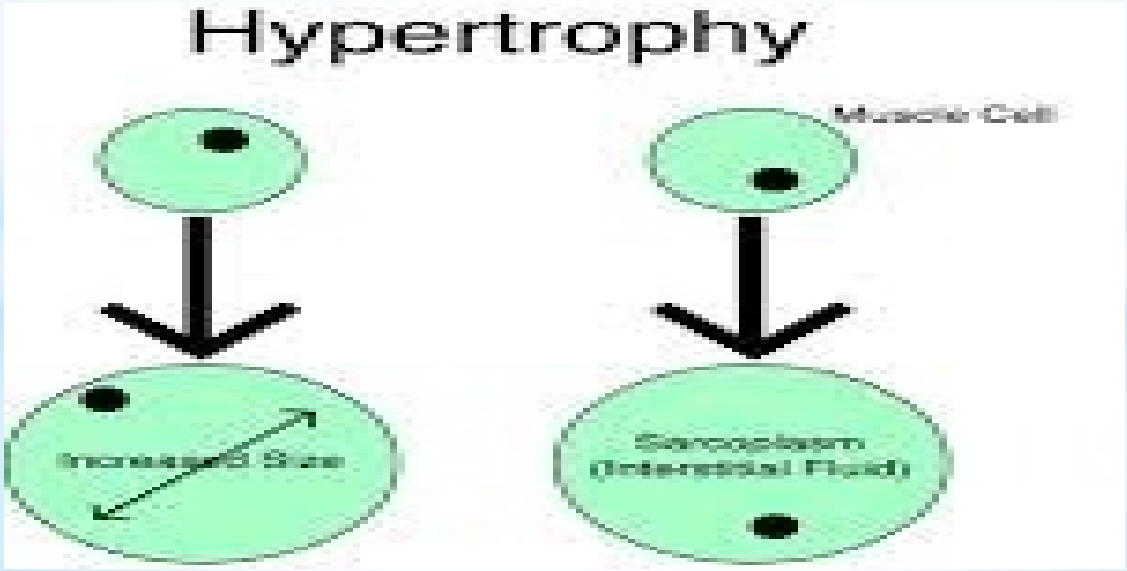
Atrophy

- Cells are smaller than normal, but are still viable. They do not normally undergo apoptosis or necrosis.
- Physiologic autotrophy – tissues/structures present in embryo or childhood may undergo autotrophy as growth and development process progresses.



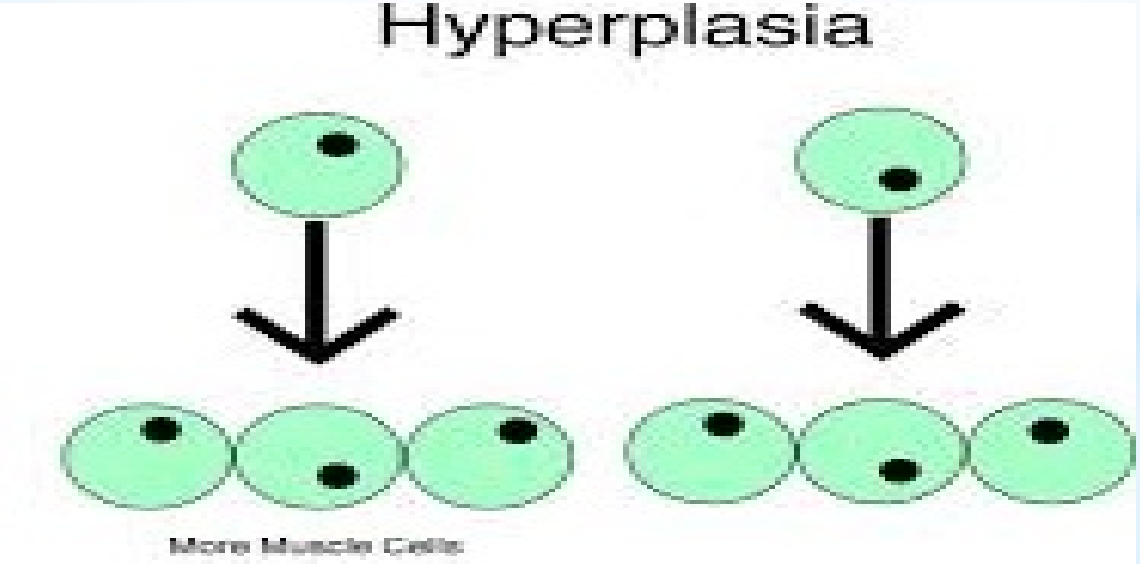
Hypertrophy

- Increase in cell SIZE, leading to increase in organ size
- Usually in terminal cells which can no longer divide, so their only recourse is enlargement
- End result is amount of increased work that each cell must perform is limited
- Physiologic hyperplasia – hormonal stimulation (hypertrophy of uterine wall during pregnancy)



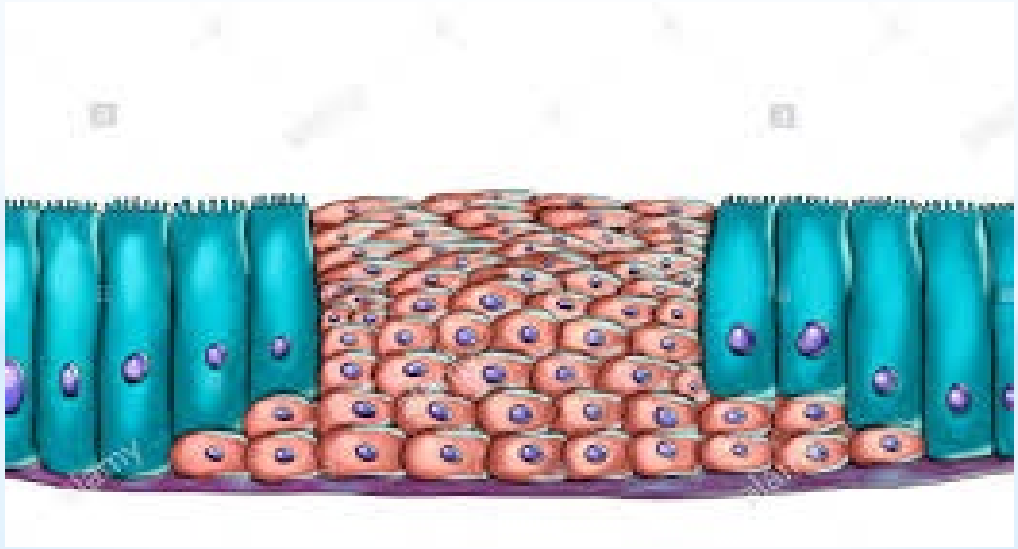
Hyperplasia

- increase in NUMBER (not size) of cells in an organ or tissue
- May be seen in combination with hypertrophy
- Physiologic hyperplasia – mechanisms include increased DNA synthesis, growth inhibitors will halt
- hyperplasia after sufficient growth has occurred
- ✓ Hormonal – hyperplasia of uterine muscle during pregnancy
- ✓ Compensatory – hyperplasia in organ after partial resection



Metaplasia

- REVERSIBLE change in which one type of adult cell (epithelial or mesenchymal) is replaced by
- another type – if stress/injury abates, metaplastic tissue may revert to original cell type
- This is a protective mechanism, not a premalignant change
- eprogramming of epithelial stem cells (reserve cells) from one type of epithelium to another



Dysplasia

Cells that look abnormal under a microscope but are not cancer. Enlarge. Normal **cells** may become cancer **cells**. Before cancer **cells** form in tissues of the body, the **cells** go through abnormal changes called hyperplasia and **dysplasia**.