Cellular Adaptation



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Hypertrophy
Hiker-trophy
Hypertrophy is described as an increased size of cells. An example of this condition is cardiac hypertrophy.

Increased Size of Cells
Up-arrow Size of Cell-phone
The increased size in hypertrophy occurs due to increased structural proteins and organelles. The increase in stress leads to an increase in cell size.

Atrophy
@-trophy
Atrophy is described as a decreased size of cells. The cause of this cell type is disuse, decreased blood supply, or decreased hormone stimulation. One of the samples of this is the cytoskeleton degradation via ubiquitin-proteasome.

Decreased Size of Cells
Down-arrow Size of Cell-phone
The decreased size in atrophy occurs due to a decrease in protein synthesis and/or the number of cells due to apoptosis. The decrease in stress leads to a decrease in cell size.

Hyperplasia
Hiker-plates
Hyperplasia is described as an increased number of cells. An example of this is endometrial hyperplasia, which may advance to dysplasia and cancer.

Increased Number of Cells
Up-arrow Number of Cell-phones
An increased number of cells in hyperplasia occurs due to excessive stimulation of the proliferation of stem cells and differentiated cells.

Metaplasia
Metal-plates
Metaplasia is described as the conversion of a cell into another type of cell. An example of this is the malignant transformation in Barrett's esophagus.

Conversion into Another Type of Cell
Conversion into Another Type of Cell-phone
This conversion occurs due to a change in stress on the cell, resulting in a change in a cell type called metaplastic cells. The metaplastic cells can handle the new stress better than the previous cell type.

Dysplasia
Disc-plates
Dysplasia is described as a precancerous cell. An example of this case is the cervical intraepithelial neoplasia. It is a type of dysplasia that can lead to cervical cancer.

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Precancerous Cell

Pre-Tumor-guy Cell-phone

Dysplasia is not considered a true adaptive response like hypertrophy and other cellular adaptations. Dysplasia is reversible if the inciting stress is alleviated, and it can be irreversible or continue to progress if the stress remains.

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