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1. Define the following terms with 2 physiological and pathological examples each.

A. Atrophy

Atrophy is disease which occure in the cell size or shrinkage in the size of cell by the loss of substance is called Atrophy.

Example:

- **Physiologic:**

  Fetal organ and utrus after partiuration

- **Pathologic:**

  Ischemic atrophy and senile atrophy ... Heart.

B. Hypertrophy

The growing up of organ or tissue due to increase in the size of cell is called Hypertrophy.

Example:

- **Physiologic:** Growth of uterus during pregnancy.
- **Pathologic:** Hypertension or aortic valve disease.

C. Hyperplasia

Hyperplasia is the number of cell increase which cause the organ enlargement as a result cell mitosis or division increase.

Example:

- **Physiologic**:
  Physiologic growth of utrus during pregnency involes both hypertrophy and hyperplasia.
- **Pathologic:**
  Growth of the adrenal gland due to production of adrenocortico tropic hormone (ATCH) by a pituitary adenoma proliferation of endometrium due to prolonged estrogen stimulus.

D. Metaplasia

Metaplasia is the revesible change in which one adult cell type is replaced by another cell type is called Metaplasia.

Example:

- **Physiologic:** Squamous metaplasia that occurs in the uterine cervix during the menstrual cycle as the squamocolumnar junction migrates across the transformation zone.
- **Pathalogical:**

I. Change associated with the respiratory tract in response to inhalation of irritants, such as smog or smoke.
II. The bronchial cell convert from mucus-secreting, ciliated. Columnar epithelium to non ciliated, squamus epithelium incapable of secreting mucuc.

2. *How does the calcium ions influx affects the cell?write it in your own words.*

Influx :

Influx Of a calcium to cell then the to cytrsal comes from the extracellular fluid to the body and store the mitochandria and endoplasmic reticulum in the cell.

- Ca+ activate the phospholipases (which damage the membrane) proteases (which damages cell membrane and cytoskeleton and endonucleases (its damage DNA).
- This is one of the main mechanisim of cell death, after these severe damage to membrane of lysosomes then occure leakage of lysosomal enzymes or apoptosis. Then its occur particularlly hyproxia and ischaemia and with certain toxins. Preventing the rise in Ca++ or restoring the normal levels and prevents cell death.
- Mitochandria perform aerobic mechanism which need O_2 and reduced oxidative phosphorylation.
- Cell membrane reduced sodium pump then sodium and water enter the cell and potassium is out.

3.What *is free radical?What is the effect of Reactive Oxygen Specie(ROS) on the cell?*

Free Radical:

Radical are atoms, molecules or ions with unpaired electrons in outer shell configuration.

- Free radical may have positive or negetaive or zero charge.
- Unpaired electrons cause radical to be high reactive.

EFFECT ON CELL:

In biological ROS are formed as a byproduct of the normal metabolisim of oxygen and have important role in cell signalling and homeostasis. However during time of environmental stress (e.g UV or heat result in significiant damage to cell structure accumulative this is called as oxidative stress. The production of ROS is strongly control by stress factor responses in plants, these factor that increase ROS production include drought, salinity,nutrient deficiency, metal toxicity and UVB radiation. ROS are also produced by exogenous sources such as ionizing radiation.

DAMAGING EFFECT:

Harmful effect of ROS on cell damage of DNA or RNA. Oxidiation of polyunsaturated fatly acid in lipids. Oxidiation of amino acid in proteins. Oxisative deactication of specific enzymes by oxidations.

4.Write down some differences between Apoptosis and Necrosis.

Apoptosis	*Necrosis*
1. Cell shrinkage and fragmentation	1. Cell swelling and lysis
2. Nuclear condensation	2. karolysis
3. No inflammatory response	3. Significiant inflammatory response
4. Pathologic	4. Pathologic and physiologic
5. Cell membrane absent	5. Cell membrane lack
6. Cell death programmed	6. Cell death intail event
7. Invole of mitocandria	7. No role in mitochandria
8. Characteristic nuclear change	8. Nuclie lost
9. Dead cell injusted by	9. Dead injusted by neutrophills
10. DNA cleavage	10. No DNA cleavage
11. Neighbouring	11. Macropages
12. Cell death final event	12. Cell death intail event

Q.5 Write a note on Air Embolism.

Air embolism occure when air is introduced into venous or arteria circulation resulting obstruction of blood flow accure.

An air embolism also known is gas embolisim. Its a blood vessel blockege caused by one or more bubble of air or other gas in the circulatory system.

Air embolism may also occure in the xylem of vascular plants, especially when suffering from water stress. An air embolism can occure when your veins or arteries are exposed and pressure allows air to travel into them.

This can happen in several way : such as

- Inject ion and surgical procedures
- Lung trauma
- Scuba diving
- Explosion and blast injuries
- Blowing into the vagina etc.

RISK FACTOR:

Any surgical procedures that can lead to infusion of air.

Creation of a pressure gradient of air entery peripheral IVS, central venous catheter etc.

Positive pressure ventilitation.

Bkunt and penetrating trauma to the chest abdomen neck or face can lead to of entery air.

THE END