APOPTOSIS AND NECROSIS

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APOPTOSIS

- It is a form of programmed cell death in multicellular organisms.
- It is one of type of programmed cell deaths and involves a series of biochemical events leading to a characteristics cell morphology and death.

Reasons for apoptosis

- The process of apoptosis is controlled by a diverse range of cell signals, which may originate either extracellulary or intracellulary.
- Extracellular signals may include toxins, hormones, growth factors , nitric oxide or cytokines, and therefore must either cross the plasma membrane or transduce to effect a response.
- These signals may positively or negatively induce apoptosis.
- Binding and subsequent initiation of apoptosis by a molecules is termed positive.
- Active repression of apoptosis by a molecule is termed negative.

Mechanism of apoptosis

- 3 mechanisms by which a cell commits suicide by apoptosis:-
- One generated by signals arising within the cell
- Another triggered by death activators binding to receptors at the cell surface
- May ne triggered by dangerous reactive oxygen species

Functions of apoptosis

- cell termination:-apoptosis can occur when a cell is damaged beyond repair , infected with a virus or undergoing stress conditions such as starvation . apoptosis plays a role in preventing cancer.
- Homeostasis:-in the adult organisms, the number of cells is kept relatively constant through cell death and division. it is achieved when the rate of mitosis in the tissue is balanced by cell death.
- Development:-programmed cell death is an integral part of both plant and animal tissue development. During development apoptosis is tightly regulated and different tissue use different signals for inducing apoptosis.

- Lymphocyte interactions:-the development of b lymphocytes and t lymphocytes in the human body is a complex process that potentially damaging to the body
- Mitochondrial regulations:-the mitochondria are essential to multicellular life .without them , a cell ceases to respire aerobically and quickly dies- a fact exploited by some apoptotic pathways . apoptotic proteins that target mitochondria affect them in different ways.

Defective apoptotic pathway

The many different types of apoptotic pathway contains a multitude of different biochemical components , many of them not yet understood . as a pathway is more or less sequential in nature it is a victim of causality ; removing or modifying one component leads to an effect in another. I9n a living organism this can have disastrous effects, often in the form of disease or disorder. a discussion of every disease caused by modification of the various apoptotic pathways would be impractical, but the concept overlying each one is the same .the normal function of the pathway has been disrupted in such away as to impair the ability of the cells to undergo normal apoptosis

necrosis

- It is a name given to unnatural death of cells and living tissue brought about by physical damage , poision or other external injury.
- It begins with cell swelling , chromatin digestion and disruption of plasma membrane and organelle membranes . late necrosis is characterized by extensive dna polymerase, organelle breakdown and cell lysis.
- The release of intracellular content after plasma membrane rupture is the cause of immflamation in necrosis.

Causes of necrosis

- Many causes of necrosis includes:-
- Injury
- Infection
- Cancer
- Infraction
- Poisons
- Inflammation
- Lack of proper care of wound site

Morphological patterns

- There are seven morphological patterns of necrosis:-
- Coagulative necrosis
- Liquefactive necrosis
- Gummatous necrosis
- Haemorrhagic necrosis
- Caseous necrosis
- Fatty necrosis
- Fibrinoid necrosis

Refrenceses

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