Cell death

Cell death is the event of a biological cell ceasing to carry out its functions. This may be the result of the natural process of old cells dying and being replaced by new ones, or may result from such factors as disease, localized injury, or the death of the organism of which the cells are part. Kinds of cell death include:

Programmed cell death (or PCD) is cell death mediated by an intracellular program.

PCD is carried out in a regulated process, which usually confers advantage during an organism's life-cycle. For example, the differentiation of fingers and toes in a developing human embryo occurs because cells between the fingers apoptose; the result is that the digits are separate. PCD serves fundamental functions during both plant and metazoa (multicellular animals) tissue development.

Vacquinol-1 (Vac), a quinolone derivative, displays promising properties by inducing rapid cell death in Glioblastoma (GBM) but not in non-transformed tissues.

CBF < 20 is generally associated with ischemia and if prolonged will produce cell death [1)].

Types

There are several types of cell death, including:

Apoptosis: This is a programmed form of cell death that occurs naturally as a part of the development and maintenance of tissues. It is also activated as a response to certain cellular stresses, such as DNA damage or cellular stressors.

Necrosis: This is an uncontrolled form of cell death that occurs due to injury, infection, or other external factors. Necrosis is often associated with inflammation and can lead to the release of cellular contents, which can trigger an immune response.

Autophagy: This is a process by which cells break down and recycle damaged organelles and other cellular components. It can be a normal part of cellular function or can be activated as a response to cellular stress.

Pyroptosis: This is a type of programmed cell death that occurs in response to infection or inflammation. Pyroptosis is characterized by the release of pro-inflammatory cytokines, which can contribute to tissue damage and inflammation.

Ferroptosis: This is a type of programmed cell death that is triggered by the accumulation of toxic levels of iron in the cell. It is characterized by the accumulation of lipid peroxides and can contribute to tissue damage and inflammation.

Paraptosis: This is a type of non-apoptotic cell death that is characterized by cytoplasmic vacuolation

and cell swelling. It is thought to be a result of disrupted cellular signaling pathways.

Oncosis: This is a type of cell death that is characterized by cell swelling and membrane rupture. It is often associated with ischemia and hypoxia, and can result in tissue damage and inflammation.

Each of these types of cell death can have different causes, consequences, and mechanisms, and can play important roles in the development, maintenance, and pathogenesis of tissues and organisms.

Cuprotosis

1)
Astrup J, Siesjö BK, Symon L. Thresholds in cerebral ischemia - the ischemic penumbra. Stroke. 1981 Nov-Dec;12(6):723-5. PubMed PMID: 6272455.