# **APOPTOSIS (II)**

#### Q.What are the apoptotic bodies?

Cells dying by apoptosis undergo characteristic morphological changes. <u>They shrink and condense, the cytoskeleton</u> <u>collapses, the nuclear envelop dissembles and the nuclear chromatin condenses and breaks up into fragments</u>. The cell surface often blebs and if the cell is large, often breaks up into *membrane enclosed fragments* called **apoptotic bodies**.

NB:Most importantly the surface of the cell or apoptotic bodies become chemically altered, so that a neighboring cell or a macrophage (a specialized phagocytic cell) rapidly engulfs them.

#### Q.Is there any trace of apoptosis in plants?

In plant it occurs during development and in the senescence of flowers and leaves, as well as in the response to injury and infection.

#### Q.How apoptosis is applicable in immune responses?

In the vertebrate immune system, apoptosis eliminates developing T and B lymphocytes that either fail to produce potentially useful antigen-specific receptors or produce self-reactive receptors that make the cells potentially dangerous. Apoptosis also eliminates most of the lymphocytes activated by an infection, after they have helped destroy the responsible microbes.

## Q.What is the purpose of using drug Phenobarbital in apoptosis?

This drug stimulates liver cell division (and thereby enlargement). Apoptosis in the liver greatly increases <u>until the</u> <u>liver has returned to its original size</u>, usually within a week or so. This drug allow the worker to establish the role of apoptosis to ensure proper balance between cell death and cell division.

## Q.Why biologists prefer phosphatidylserine as a potent marker of apoptosis?

The negatively charged phospholipid *phosphatidylserine* is normally exclusively located in the innerleaflet of the lipid bilayer of the plasma membrane, but it <u>flips to the outer leaflet in apoptotic cells</u>, where it can serve as a <u>marker of these cells</u>. The *phosphatidylserine* on the surface of apoptoic cells can be visualized with alabeled form of the **Annexin V** protein, which specially binds to this phospholipid. This *phosphatidylserine* helps signal to neighboring cells and macrophages to phagocytose the dying cell. In addition to that it also blocks the inflammation often associated with phagocytosis. *Phosphatidylserine* stimulates Phagocytosis.

## Q."Cytochrome c is used as possible marker of Phagocytosis"—justify.

Cells undergoing apoptosis often lose the electrical potential that normally exists across the inner membrane of their mitochondria. Proteins such as **cytochrome c** are usually released from the space between inner and outer membrane (intermebrane space) of mitochondria during apoptosis and the relocation of cytochrome c from mitochondria to the cytosol can be used as marker of apoptosis.

## Q.How ICE is concerned with apoptosis?

Interleukin-1-converting enzyme is a caspase of human, which is concerned with inflammatory responses rather than with cell death. It cuts out the inflammation-inducing cytokine *interleukin-1 (IL-1)* from a larger precursor protein.