

The Programmed Cell Death: An Essential Function of Body

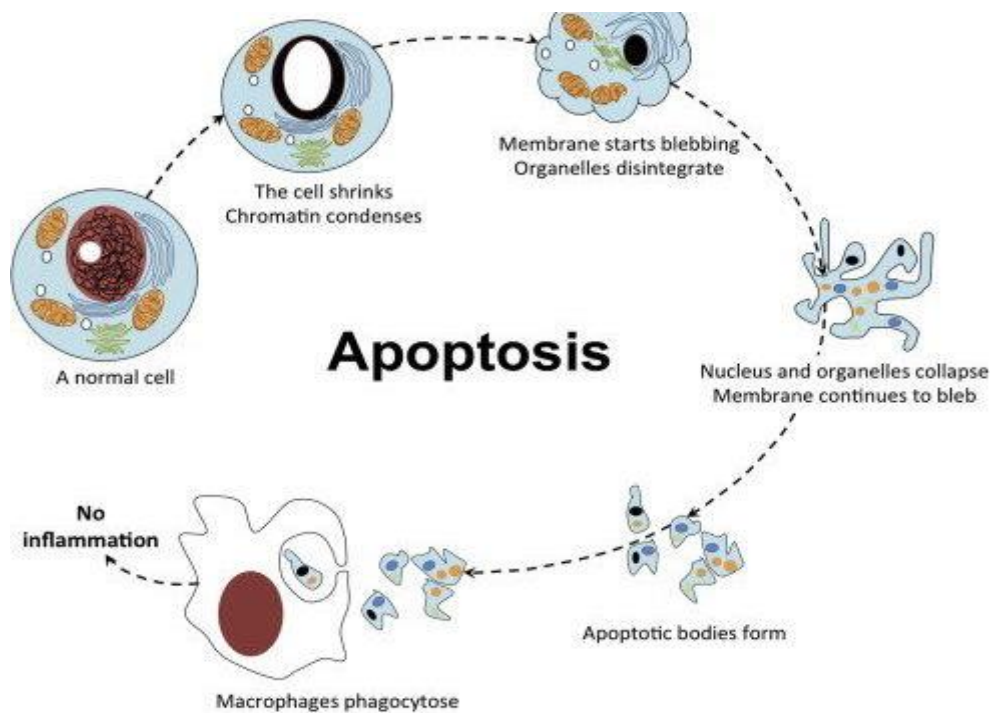
Akash Bairwa

Veterinary Surgeon in Manali Strays Hospital, Manali, Kullu-175136

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One of the weirdest fate of the cell is the programmed cell death. Despite being odd-fate, it is essential for the body. Cell death is regulated by cellular interactions in two fundamentally distinct ways. First, majority of the cells, if not all, in multicellular organisms need signals to remain alive. In case if such survival signals, frequently referred to as trophic factors, are lacking, cells activate a “suicide” program. Secondly, in some developmental conditions, including the immune system, specific signals produce a “murder” program that kills cells.

Recent studies suggest that whether cells commit suicide for absence of survival signals or are murdered by killing signals from other cells, death is mediated by a common molecular pathway.



Apoptosis (Programmed cell death)



Programmed Cell Death Occurs Through Apoptosis:

- The occurrence of cell death in programmed way is marked by a well-defined sequence of morphological changes, collectively termed as apoptosis.
- Apoptosis is a Greek word that refers “dropping off” or “falling off,” as in leaves from a tree.
- Dying cells at first shrink and condense and then fragment, releasing small membrane-bound apoptotic bodies.
- These apoptotic bodies are generally engulfed by other cells, such as macrophages. The nuclei condense and the DNA is fragmented. phosphatidylserine is permitting the other phagocytic cells to bind and eat the fragments.

Role of genes in apoptosis:

- The genes involved in controlling cell death encode proteins with three different functions:
- “Killer” proteins are required for a cell to begin the apoptotic process.
- “Destruction” proteins are responsible for things like digesting DNA in a dying cell.
- “Engulfment” proteins are needed for phagocytosis of the dying cell by another cell.
- Apoptosis is useful for the elimination of various cancerous or infected cells.
- It will detect the threats arising from the viral infections, DNA damage, precancerous cells and will eliminate them.
- The development and regulation of immune system is also performed by apoptosis.
- B and T cells are first tested if they respond to any of body’s own cell components. If they do so, they are eliminated right away by the apoptosis.
- For the maintenance of immune system, apoptosis has a significant role.
- When a pathogen enters the body, various immune cells specific to the pathogen divide largely and fight the pathogen.
- After combatting the pathogen, those immune cells are now not required and thus under apoptosis so as to maintain balance in immune system.