

Apoptosis Quiz Questions and Answers PDF

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Which pathway is initiated by internal signals in apoptosis?

- Extrinsic pathway
- Intrinsic pathway ✓**
- Necrotic pathway
- Autophagic pathway

The intrinsic pathway of apoptosis is initiated by internal signals, such as DNA damage or oxidative stress, leading to mitochondrial changes and the activation of caspases.

What is apoptosis?

- A form of programmed cell death ✓**
- A type of cell division
- A form of cellular growth
- A type of inflammation

Apoptosis is a programmed cell death process that is essential for maintaining cellular homeostasis and development in multicellular organisms. It allows the body to eliminate damaged or unnecessary cells in a controlled manner.

Which family of proteins is crucial for regulating apoptosis?

- Kinase family
- Bcl-2 family ✓**
- G-protein family
- Cyclin family

The Bcl-2 family of proteins plays a critical role in regulating apoptosis by controlling the balance between pro-apoptotic and anti-apoptotic signals within the cell.

How can apoptosis be detected and measured in a laboratory setting?

Apoptosis can be detected using assays like TUNEL, which labels DNA breaks, or Annexin V staining, which identifies phosphatidylserine exposure on cell membranes.

What are the roles of apoptosis in the body? (Select all that apply)

- Tissue homeostasis ✓**
- Immune system regulation ✓**
- Uncontrolled cell proliferation
- Removal of damaged cells ✓**

Apoptosis plays crucial roles in maintaining cellular homeostasis, eliminating damaged or potentially harmful cells, and shaping developing tissues. It is essential for processes such as immune response, tissue remodeling, and preventing cancer.

How does apoptosis contribute to the prevention of cancer?

Apoptosis eliminates damaged or potentially cancerous cells, preventing them from proliferating and forming tumors.

Explain the difference between the intrinsic and extrinsic pathways of apoptosis.

The intrinsic pathway is initiated by internal signals, often involving mitochondrial release of cytochrome c, while the extrinsic pathway is triggered by external signals binding to death receptors on the cell surface.

Describe the role of p53 in the regulation of apoptosis.

p53 is a tumor suppressor gene that regulates apoptosis by activating pro-apoptotic genes in response to DNA damage, thus preventing the proliferation of damaged cells.

Which gene is known as the "guardian of the genome" and is involved in apoptosis regulation?

- BRCA1
- p53 ✓
- MYC
- RAS

The gene known as the "guardian of the genome" is p53, which plays a crucial role in regulating the cell cycle and promoting apoptosis in response to DNA damage.

Which assays are used to detect apoptosis? (Select all that apply)

- TUNEL assay ✓
- Western blot
- Annexin V staining ✓
- ELISA

Common assays used to detect apoptosis include Annexin V staining, TUNEL assay, and caspase activity assays. These methods help identify and quantify apoptotic cells in various biological samples.

What is the role of caspases in apoptosis?

- To promote cell growth
- To inhibit cell division
- To execute cell death ✓**
- To repair DNA

Caspases are a family of cysteine proteases that play a crucial role in the execution phase of apoptosis by cleaving specific substrates, leading to cellular dismantling and death.

Which of the following are characteristics of apoptosis? (Select all that apply)

- Cell shrinkage ✓**
- Inflammation
- DNA fragmentation ✓**
- Membrane blebbing ✓**

Apoptosis is characterized by specific cellular changes such as cell shrinkage, chromatin condensation, and the formation of apoptotic bodies. These features distinguish it from necrosis, which is a form of uncontrolled cell death.

Which of the following is a characteristic feature of apoptosis?

- Cell swelling
- Membrane rupture
- Chromatin condensation ✓**
- Inflammation

Apoptosis is characterized by specific morphological changes such as cell shrinkage, chromatin condensation, and the formation of apoptotic bodies. These features distinguish it from necrosis, which is a form of uncontrolled cell death.

Discuss the potential therapeutic strategies that target apoptosis in disease treatment.

Therapies may aim to induce apoptosis in cancer cells or inhibit excessive apoptosis in diseases like neurodegeneration, using drugs that modulate apoptotic pathways.

What are the consequences of excessive apoptosis in neurodegenerative diseases?

Excess apoptosis can lead to the loss of neurons, contributing to diseases such as Alzheimer's and Parkinson's, resulting in cognitive and motor function decline.

Which proteins are part of the Bcl-2 family? (Select all that apply)

- Bax ✓
- Bcl-2 ✓
- Fas
- Bak ✓

The Bcl-2 family consists of both pro-apoptotic and anti-apoptotic proteins that regulate apoptosis. Key members include Bcl-2, Bcl-xL, Bax, and Bak.

Which of the following are involved in the intrinsic pathway of apoptosis? (Select all that apply)

- Cytochrome c ✓
- Death receptors
- Mitochondria ✓
- Caspase-8

The intrinsic pathway of apoptosis is primarily regulated by mitochondrial factors and involves proteins such as cytochrome c, Bcl-2 family members, and caspases. These components work together to initiate the apoptotic process in response to internal cellular stress signals.

What distinguishes apoptosis from necrosis?

- Apoptosis is energy-independent
- Necrosis is a controlled process
- Apoptosis involves DNA fragmentation ✓
- Necrosis is programmed cell death

Apoptosis is a programmed and controlled process of cell death that occurs in a regulated manner, while necrosis is an uncontrolled form of cell death resulting from injury or disease, often leading to inflammation.

Which molecule is released from mitochondria to activate apoptosis?

- ATP
- Cytochrome c ✓
- Glucose
- Oxygen

Cytochrome c is the molecule released from mitochondria that plays a crucial role in the activation of apoptosis, or programmed cell death. It triggers the apoptosome formation, leading to the activation of caspases that execute the cell death program.

What can result from dysregulation of apoptosis? (Select all that apply)

- Cancer ✓
- Neurodegenerative diseases ✓
- Enhanced immune response
- Tissue regeneration

Dysregulation of apoptosis can lead to various health issues, including cancer, autoimmune diseases, and neurodegenerative disorders. This imbalance can result in either excessive cell survival or increased cell death, both of which can disrupt normal tissue homeostasis.