

Questions for test –control on the theme «Cell injury»

The first level.

- 1. The mechanisms of cell injury:**
 1. activation of lipid peroxidation
 2. activation of membrane phospholipases
 3. release of enzymes from lysosomes
 4. activation of DNA reparation enzymes
 5. expression of oncogene
- 2. The signs of cell injury:**
 1. increased intracellular ATP
 2. increased intracellular Na^+
 3. increased intracellular Ca^{2+}
 4. increased intracellular pH
- 3. The functional signs of the cell injury:**
 1. decreased cytoplasmic membrane permeability
 2. interruption of cell proliferation
 3. reduction of specialized cellular function
 4. decreased cellular ATP synthesis
 5. decreased cell mobility
- 4. Enumerate the consequences of the damaged cytoplasm membrane ATP-dependent and damaged ion-exchange mechanisms :**
 1. increased intracellular Na^+
 2. decreased intracellular Ca^{2+}
 3. decreased intracellular K^+
 4. increased intracellular Ca^{2+}
 5. increased intracellular K^+
- 5. The «nonspecific» manifestations of cell injury:**
 1. cytoplasmic acidosis
 2. formation of radio toxins
 3. activation of lysosome enzymes
 4. denaturation of protein molecules
 5. increased cytoplasm membrane permeability
- 6. The signs of irreversible cell injury:**
 1. output of structural proteins from cytoplasmic membrane
 2. increased intracellular Ca^{2+}
 3. swelling of mitochondria
 4. precipitation of Ca –salts inside mitochondria
 5. output of enzymes from lysosome
- 7. The injury of which cellular components will lead to immediate cell death?**
 1. lysosome
 2. Nucleus
 3. endoplasmic reticulum
 4. Plasma membrane

8. **The activation of which biochemical processes will lead to injury of the cytoplasmic membrane?**
 1. aerobic glycolysis
 2. Proteolysis
 3. lipid peroxidation
 4. Phospholipolysis
9. **Why does the intracellular pH change during the cell injury?**
 1. decreased H⁺ utilization
 2. activation of anaerobic glycolysis
 3. accumulation of incompletely oxidized metabolic products
 4. activation of ATP resynthesis
 5. increased intracellular osmotic pressure
10. **The signs of apoptotic cell death:**
 1. release and activation of lysosome enzymes
 2. cell wrinkling
 3. forming of bodies containing fragments of nucleus and organelles
 4. disorganized breaks of DNA
 5. unimpaired cytoplasmic membrane
11. **The consequences of apoptotic cell death:**
 1. destruction and elimination of single cells
 2. autolysis of dead cells by lysosome enzymes
 3. phagocytosis of separated fragments of cells by macrophages
 4. formation of zone with great number of dead and damaged cells
12. **The signs of necrotic cell death:**
 1. condensation of chromatin
 2. karyolysis
 3. swelling of cells
 4. membrane injury
 5. break down of DNA in exactly distinct sites
13. **The consequences of necrotic cell death:**
 1. autolysis of dead cells
 2. formation of zone with great number of dead and damaged cells
 3. development of inflammation
 4. destruction and elimination of single cells without damage of the tissue
14. **The direct consequences of the reduction of pH in the damaged cell:**
 1. damage of the cell membrane proteins
 2. activation of lipid peroxidation
 3. activation of lysosome phospholipases and proteases
 4. increased lysosome membrane permeability
 5. activation of glycolysis
15. **Point out the nonenzymatic cellular antioxidants:**
 1. ceruloplasmin
 2. Vitamin E
 3. ubiquinone
 4. Catalase
16. **Choose factors, promoting the lipid peroxidation of membranes during the ischemic cell injury:**
 1. depression of O₂-radicalgenerating systems

2. presence of residual content of O₂ in the tissues
3. deficit of energy
4. increased levels of prooxidants
5. decreased activity of antioxidant enzyme systems
- 17. The factors, promoting the cellular hyperhydration during the cell injury:**
 1. increased intracellular Ca²⁺
 2. increased intracellular Na⁺
 3. depression of anaerobic glycolysis
 4. increased cytoplasmic membrane permeability
- 18. The cellular defense system from damaged effects of free radicals consists of:**
 1. superoxide dismutase
 2. Phospholipase A₂
 3. glutathione peroxidase
 4. Catalase
 5. adenylatecyclase
- 19. Point out the causes of the cellular hyperhydration during cell injury:**
 1. increased cytoplasmic membrane permeability
 2. activation of lipid peroxidation
 3. increased intracellular osmotic pressure
 4. increased activity of glycogen synthetase
- 20. Point out the factors, causing irreversible cell injury during the reperfusion:**
 1. increased intracellular Na⁺
 2. significant loss of adenine bases by cell
 3. overload of mitochondria by Ca²⁺
 4. output of integral proteins from cytoplasmic membrane
 5. activation of lysosome enzymes
- 21. Point out the mechanisms of cell injury during the reperfusion:**
 1. activation of membrane phospholipases
 2. excess of intracellular Ca²⁺
 3. activation of oxidizing phosphorylation
 4. activation of lipid peroxidation
 5. increase in entry of O₂ into damaged cell
- 22. Point out the enzymes of antimutant cellular system:**
 1. ligase
 2. Restrictase
 3. adenylatecyclase
 4. DNA-polymerase
 5. histaminase
- 23. Choose the consequences of complement system activation:**
 1. inhibition of phagocytosis
 2. activation of mast cells degranulation
 3. osmotic lysis of target-cell
 4. apoptosis of target-cell
 5. activation of neutrophils
- 24. Point out the consequences of increased intracellular Ca²⁺:**
 1. activation of Ca²⁺-depended proteases

2. decreased osmotic cytoplasmic pressure
3. activation of membrane-bound phospholipases
4. activation of lipid peroxidation
5. activation of antioxidant system enzymes
- 25. Choose the compensative changes of intracellular metabolism during the ischemic cell injury:**
 1. increased of anaerobic glycolysis
 2. decreased protein synthesis
 3. oxidation and phosphorylation dissociation in mitochondria
 4. mobilization of glycogen
 5. intensification of arachidonic acid metabolism
- 26. Point out the compensative reactions of the cell during ischemic cell injury:**
 1. restriction of synthetic processes
 2. decreased functional activity of cell
 3. activation of anaerobic glycolysis
 4. activation of lipid peroxidation
 5. activation of membrane-bound phospholipases
- 27. Choose the effects of membrane lipid peroxidation:**
 1. changed conformation of receptor proteins
 2. decreased cytoplasmic membrane permeability
 3. decreased intracellular Ca^{2+}
 4. disturbance of activity of membrane-bound enzymes
 5. disturbance of cytoplasmic membrane structure
- 28. The intracellular organelles which protect the cell from excessive accumulation of intracellular Ca^{2+} are:**

1. lysosomes	2. Mitochondria
3. sarcoplasmic reticulum	4. Nucleus
5. ribosomes	
- 29. The causes of phospholipase activation during cell injury include:**
 1. deficit of energy
 2. increased intracellular Na^+
 3. increased intracellular Ca^{2+}
 4. intracellular acidosis
 5. intensification of lipid peroxidation
- 30. Point out the factors which can disturb the functions of cellular receptors:**
 1. desensitization
 2. activation of lipid peroxidation
 3. activation of guanylatecyclase
 4. activation of membrane-bound phospholipases
 5. activation of calmodulin
- 31. The pathogenetic factors of ischemic cell injury include:**
 1. increased intracellular Ca^{2+}
 2. activation ATP-dependent transport enzymes
 3. activation of membrane-bound phospholipases

- 4. activation of lipid peroxidation
- 5. intracellular alkalosis

32. Which ions can activate membrane-bound phospholipases:

- 1. Ca^{2+}
- 2. K^+
- 3. H^+
- 4. Na^+

33. The factor which can activate phospholipases of lysosome membrane:

- 1. Ca^{2+}
- 2. H^+
- 3. K^+
- 4. Na^+

34. Point out the intracellular adaptive mechanisms during acute cell injury:

- 1. activation of glycolysis
- 2. intensification of Ca^{2+} -entering into cell
- 3 dissociation between oxidation and phosphorylation in mitochondria
- 4. activation of DNA-polymerases and ligases
- 5. activation of antioxidant protective factors

35. Choose the pathogenetic factors of the cell injury during changes of its genetic program

- 1. changed gene structure
- 2. expression of pathological genes
- 3. repression of normal genes
- 4. expression of genes of the main complex of histocompatibility
- 5. translocation of genes

36. Write down the scheme of the vicious circle during ischemic cell injury:

- 1. development of intracellular acidosis
- 2. damage of membranes and mitochondria enzymes
- 3. decreased ATP level in the cell
- 4. decreased ATP synthesis in mitochondria
- 5. activation of anaerobic glycolysis

37. Write down the scheme of the vicious circle during ischemic cell injury:

- 1. decreased ATP synthesis
- 2. damage of membranes and mitochondria enzymes
- 3. deficit intracellular ATP
- 4. activation of lipid peroxidation
- 5. deficit of O_2 and metabolic substrates

38. Write down the scheme of the vicious circle during ischemic cell injury:

- 1. increased intracellular Ca^{2+}
- 2. decreased ATP synthesis
- 3. inactivation of ATP-dependent transport enzymes
- 4. activation of proteases and mitochondria membrane phospholipases
- 5. decreased intracellular ATP

39. The general mechanisms of the biological membrane damage:

- 1. including of amphiphil-forming micelles in a plasma membrane
- 2. activation of lipid peroxidation
- 3. activation of membrane-bound phospholipases and proteases
- 4. dissociation between oxidation and phosphorylation in mitochondria
- 5. activation of anaerobic glycolysis

40. Point out the most pathogenetic factors of cell injury:

1. excess of intracellular Ca^{2+}
2. intracellular deficit of energy
3. deficit of intracellular H^+
4. loss of cellular purine bases
5. increased cytoplasmic membrane permeability