

Cellular injury and adaptation

- 1. In reversible cell injury all are true except**
 - a. ATP depletion is responsible for acute cellular swelling
 - b. Can cause myocardial cells to cease contraction within 60 seconds
 - c. ATP is generated anaerobically from creatine phosphate
 - d. Mitochondrial swelling and degranulation of ER are hallmarks of irreversible cellular injury
 - e. Is associated with myelin figures

- 2. Metaplasia**
 - a. Is irreversible
 - b. Is commonly a change from squamous to columnar epithelium
 - c. An example is the transformation of epithelial cells into chondroblasts
 - d. Retinoids may play a role
 - e. Even if the stimuli is persistent it is a benign lesion

- 3. In apoptosis**
 - a. It involves physiologic and pathologic stimuli
 - b. Histologically, it involves coagulation necrosis
 - c. Its DNA breakdown is random and diffuse
 - d. Its mechanism involves ATP depletion
 - e. It involves an inflammatory tissue reaction

- 4. Hyperplasia**
 - a. Occurs after partial hepatectomy
 - b. Refers to an increase in the size of the cells
 - c. Is always pathological
 - d. Often occurs in cardiac and skeletal muscle
 - e. Usually progresses to cancerous proliferation

- 5. Metastatic calcification**
 - a. Causes widespread tissue damage
 - b. Occurs with normal calcium levels
 - c. Can be caused by systemic sarcoidosis
 - d. Occurs in hypothyroidism
 - e. Is caused by drinking large quantities of milk

- 6. Which is incorrect in regards to apoptosis**
 - a. It may be regarded as a normal physiological process
 - b. It is characterized by chromatin condensation
 - c. It often elicits a strong inflammatory response
 - d. It is the process by which ovaries atrophy in post-menopausal women
 - e. It is characterized by cell shrinkage

- 7. Coagulative necrosis**
 - a. Results from necrosis in which cellular enzymatic digestion predominates over denaturation
 - b. Is characterized by marked WBC infiltrate
 - c. Is uncommon after mi
 - d. Usually occurs after irreversible ischaemic cellular damage
 - e. Is not usually seen in association with caseating necrosis

8. Metaplasia is seen in all of the following except

- a. Respiratory epithelium of smokers
- b. Vitamin a excess
- c. Barrett's oesophagitis
- d. Epithelium of a pancreatic duct containing stones
- e. Foci of cell injury

9. Anaplasia is not characterized by

- a. Pleomorphism
- b. Abundant nuclear DNA
- c. A nuclear : cytoplasm of 1 : 6
- d. Coarsely clumped chromatin
- e. Lack of differentiation

10. Apoptosis

- a. Is usually stimulated by hypoxia
- b. Produces a moderate degree of inflammation
- c. Features chromatin aggregates
- d. Is the underlying process in caseous necrosis
- e. Is stimulated by decreased cytosolic calcium

11. Irreversible cell injury is characterized by

- a. Dispersion of ribosomes
- b. Cell swelling
- c. Lysosomal rupture
- d. Cell membrane defects
- e. Nuclear chromatin clumping

12. Dystrophic calcification can be caused by

- a. Sarcoidosis
- b. Multiple myeloma
- c. Advanced renal failure
- d. Advanced atherosclerosis
- e. All of the above

13. Metaplasia

- a. Is an increase in the number and size of cells in a tissue
- b. Is the process that occurs in Barrett's oesophagitis
- c. Is typically an irreversible process
- d. In the respiratory tract preserves mucous secretion
- e. Can be caused by Vit B12 deficiency

14. Which is correct

- a. Hyperplasia constitutes an increase in the size of cells in an organ or tissue
- b. Transudate has a protein level of <30g/dL, SG<1.012 and LDH<200mmol/L
- c. Apoptosis is reversible
- d. Failure of Na/K ATP-ase membrane transport is an irreversible process
- e. Morphological changes evident of irreversible cell injury includes clumping of chromatin

15. Which is correct

- a. Metaplasia is irreversible
- b. Fibronectin is produced by dying cells and may result in pigmentation
- c. Reversibly injured cells are frequently shrunken and pyknotic
- d. Lipofuscin is a yellow-brown pigment seen typically after surgical procedures
- e. Metastatic calcification refers to deposition of calcium within normal tissues

16. Metaplasia

- a. Involves an adaptive response of individual cells
- b. In Barrett's oesophagitis, involves a change from columnar to squamous cells
- c. Involves a neoplastic transformation of stem cells
- d. Vit A deficiency suppresses respiratory epithelial keratinisation
- e. Is reversible

17. Regarding atrophy and hypertrophy

- a. Hypertrophy refers to an increase in the number of cells in an organ or tissue
- b. The phenotype of an individual cell may be altered in hypertrophy
- c. Atrophy is always pathological
- d. In the heart, trophic triggers are the only factors that cause hypertrophy
- e. The colour of brown atrophy is due to melanin pigmentation

18. Cytosolic calcium in cell injury

- a. Only enters by active transport
- b. Partially derives from mitochondria
- c. Increases ATP
- d. Inactivates phospholipase
- e. Inactivates protease

19. Metaplasia (2 correct)

- a. Is usually a premalignant condition
- b. Is due to genetic reprogramming of cells
- c. May be regulated by Vit B12
- d. The most common type is from squamous to columnar epithelium
- e. Is irreversible
- f. Does not occur in mesenchymal cells
- g. May progress to cancer transformation
- h. Is usually accompanied by hypertrophy

20. Hypertrophy

- a. Occurs after partial hepatectomy
- b. Is triggered by mechanical and trophic chemicals
- c. Increases function of an organ exponentially
- d. Is usually pathological
- e. Occurs after denervation

21. Dystrophic calcification

- a. Is formed only in coagulative necrosis
- b. Is formed by crystalline calcium phosphate mineral
- c. Is rarely found in mitochondria
- d. Rarely causes organ dysfunction
- e. Does not occur on heart valves

22. All of the following are morphological features of apoptosis except

- a. Cell swelling
- b. Chromatin condensation
- c. Lack of inflammation
- d. Phagocytosis of apoptotic bodies
- e. Formation of cytoplasmic blebs

23. Irreversible cell injury is characterized by

- a. Loss of functional polarity in polarized epithelium
- b. Detachment of ribosomes from ER
- c. Acute cellular swelling
- d. Severe mitochondrial vacuolization
- e. Formation of membrane blebs

24. Features of reversible cell injury include all except

- a. Swelling of the cell
- b. Clumping of nuclear chromatin
- c. Autophagy by lysosomes
- d. Nuclear karyorrhexis
- e. Ribosomal dispersal

25. Metaplasia is

- a. Reversible change from one cell type to another
- b. Irreversible change from one cell type to another
- c. Reduced function of cell
- d. Increase in the number of cells
- e. Increase in the size and function of cells

26. In necrosis

- a. The nuclear changes are due to non-specific breakdown of DNA
- b. Karyolysis and pyknosis are the only 2 types of nuclear changes
- c. In caseous necrosis the basic outline of the cells is preserved
- d. There is a decreased eosinophilia in the necrotic cells
- e. Liquefaction necrosis is characteristic of hypoxic injury

27. Dysplasia

- a. Is a feature of mesenchymal cells
- b. Inevitably progresses to cancer
- c. Is characterized by cellular pleomorphism
- d. Is not associated with tissue architectural abnormalities
- e. Is the same as carcinoma in situ

28. Regarding atrophy, which is false

- a. Persistence of residual bodies
- b. Decrease in myofilaments
- c. Decreased rough ER
- d. Decreased autophagic vacuoles
- e. Decreased smooth ER

- 29. Which of the following is an example of hypertrophy**
- Increase in liver size after a partial hepatectomy
 - Increase in the size of the female breast
 - Increase respiratory epithelium in response to Vit A deficiency
 - Increase in size of the female uterus in pregnancy
- 30. Regarding fatty change, which is false**
- May result from protein malnutrition
 - Fatty acids are oxidized in the mitochondria
 - May result from diabetes mellitus
 - May represent unmasking of normal cell fat content
- 31. Examples of hyperplasia include**
- Glandular epithelium of pubertal breasts
- 32. Metastatic calcification occurs in**
- Old LN
 - Gastric mucosa
 - Atherosclerotic vessels
 - Damaged heart valve

Answers

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|-------|-----------|-------|
| 1. D | 12. D | 23. D |
| 2. D | 13. B | 24. D |
| 3. A | 14. B | 25. A |
| 4. A | 15. E | 26. A |
| 5. C | 16. E | 27. C |
| 6. C | 17. B | 28. D |
| 7. D | 18. B | 29. D |
| 8. B | 19. B + G | 30. D |
| 9. C | 20. B | 31. - |
| 10. C | 21. B | 32. B |
| 11. D | 22. A | |