

Practice questions - Lecture 1 - Adaptation Mechanisms and Cell Injury

**** means hard question**

1. Which of the following best describes hypertrophy?

- A. An increase in the number of cells in a tissue
- B. An increase in the size of individual cells
- C. A decrease in cell size and function
- D. A change from one differentiated cell type to another

2. Which of the following is an example of physiologic atrophy?

- A. Skeletal muscle atrophy following denervation
- B. Tissue atrophy caused by chronic ischemia
- C. Endometrial atrophy following menopause
- D. Muscle atrophy caused by prolonged immobilization

3. Vitamin A deficiency can lead to squamous metaplasia of the bronchi because vitamin A is important for:

- A. Normal epithelial differentiation
- B. Increasing protein degradation
- C. Decreasing cellular energy requirements
- D. Preventing all forms of cellular injury

4. A patient undergoes partial liver resection. The remaining liver tissue increases in cell number to compensate for the lost tissue. This is an example of:

- A. Pathologic hypertrophy
- B. Physiologic hyperplasia
- C. Pathologic atrophy
- D. Metaplasia

5. Which of the following is a characteristic of pathologic hyperplasia?

- A. It occurs only in tissues that cannot divide
- B. It may result from excessive hormonal stimulation
- C. It always progresses to cancer
- D. It is caused exclusively by decreased blood supply

6. Warts result from induced hyperplasia of epithelial cells due to which of the following?

- A. Compensatory stimulation
- B. Increased functional demand
- C. Viral infection, specifically human papillomavirus (HPV)
- D. Excessive hormonal stimulation

7. A patient has a limb immobilized in a cast following a fracture. After several weeks, the muscles decrease in size due to reduced workload. This is an example of:

- A. Physiologic hyperplasia
- B. Pathologic hypertrophy
- C. Atrophy due to decreased workload
- D. Metaplasia due to chronic irritation

8. Which of the following is a major mechanism responsible for hypertrophy?

- A. Decreased protein synthesis
- B. Increased autophagy
- C. Replacement of one cell type by another
- D. Increased synthesis of structural proteins and organelles

9. A chronic smoker develops replacement of the normal respiratory epithelium by squamous epithelium. Which cellular adaptation has occurred?

- A. Hypertrophy
- B. Hyperplasia
- C. Atrophy
- D. Metaplasia

10. Which of the following is an example of pathologic hyperplasia?

- A. Liver regeneration after partial resection
- B. Breast development during puberty
- C. Endometrial hyperplasia induced by excessive estrogen
- D. Endometrial atrophy following menopause

11. Which of the following mechanisms contributes to cellular atrophy?

- A. Increased protein synthesis and decreased degradation
- B. Decreased protein synthesis and increased protein degradation
- C. Increased cell proliferation
- D. Reprogramming of stem cells into another cell type

12. Which statement about metaplasia is correct?

- A. It is an irreversible increase in cell size
- B. It involves reprogramming of stem cells or undifferentiated precursor cells into a different differentiated cell type
- C. It always represents malignant transformation
- D. It occurs only in tissues without stem cells

13. A patient develops muscle wasting following damage to the nerve supplying the muscle. Which mechanism best explains this finding?

- A. Loss of innervation
- B. Excessive hormonal stimulation
- C. Increased functional demand
- D. Viral stimulation of cell proliferation

****14. All of the following are examples of cellular adaptations induced or promoted by hormonal stimulation, EXCEPT:**

- A. Breast enlargement during pregnancy and preparation for lactation
- B. Enlargement of uterine smooth muscle during pregnancy
- C. Benign prostatic hyperplasia (BPH)
- D. Squamous metaplasia of the respiratory epithelium

15. Atherosclerosis can reduce blood flow to tissues, leading to hypoxia and cell injury. Under which category of causes of cell injury is this best classified?

- A. Immunologic reactions
- B. Infectious agents
- C. Oxygen deprivation
- D. Genetic factors

- 1 B
- 2 C
- 3 A
- 4 B
- 5 B
- 6 C
- 7 C
- 8 D
- 9 D
- 10 C
- 11 B
- 12 B
- 13 A
- 14 D (BPH is pathologic but still caused by hormonal stimulation (excessive))
- 15 C

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