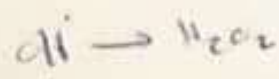
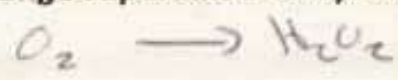


1- Which of the following is incorrect about cell adaptation?

- a) It is changes in the number, size, or functions of cells in response to stimuli
- b) Cell adapts to maintain its functions, to escape cell injury and to maintain its survival
- c) Hypertrophy is a type of cell adaptation which refers to an increase in the number of cells
- d) Metaplasia is cell adaptation which refers to a conversion of one cell type to another
- e) Atrophy is a type of cell adaptation caused by disuse, denervation, poor nutrition or ischemia

2- Which of the following enzymes is required to change superoxide to hydrogen peroxide?

- a) Superoxide dismutase
- b) Catalase
- c) Lipase
- d) Glutathione peroxidase
- e) a and d



3- Which of the following is incorrect about apoptosis?

- a) It is a programmed cell death that eliminates injured and aged cells
- b) Cells undergoing apoptosis have characteristic features as shrinking, chromatin condensation, DNA fragmentation, membrane blebbing and apoptotic bodies formation
- c) Apoptotic bodies are eliminated by M1 macrophages through phagocytosis process
- d) The intrinsic pathway of apoptosis is activated by conditions such as DNA damage, ROS, and hypoxia, which activates p53 protein
- e) Caspase-3 activation is a common step to both the extrinsic and intrinsic pathways

4- Which of the following immune cells are not related to adaptive immune cells?

- a) CD3⁺CD8⁺ T cells
- b) Neutrophils
- c) CD3⁺CD4⁺ T cells
- d) Regulatory T cells
- e) B cells

5- Which of the following is correct about innate immune cells?

- a) All innate immune cells arise from CMP during hematopoiesis process
- b) Macrophages circulate in the blood and migrate into tissues, where they differentiate into monocytes
- c) DCs are found in the blood as mature cells, and once activated, they migrate to the lymph nodes to activate NK cells
- d) Neutrophils are the first cells act against pathogens in innate immune system
- e) a and d

6- Which of the following is incorrect about T lymphocytes production?

- a) Thymocytes secrete thymosin and thymotaxin to attract TCP into the medulla of thymus ✓
- b) TCP directly differentiates into double negative CD3⁺ T cells ✓
- c) CD8⁺ T cells differentiate from double positive CD3⁺ T cells in response to MHC class expressed thymocytes ✓
- d) a and b
- e) a and c

7- Which of the following is an inhibitory receptor of NK cells?

- a) NKG2G
- b) NKp30
- c) NKp44
- d) NKp46
- e) NKG2A

8- Which of the following cytokines is required for TH2 cell differentiation?

- a) IL-2
- b) IL-4
- c) IL-12 → TH1
- d) IL-6 → TH17
- e) IL-10

9- Which of the following cells is considered as APC?

- a) CD3⁺CD4⁺ T cells
- b) Regulatory T cells
- c) NK cells
- d) DCs
- e) Plasma B cells

10- Which of the following is incorrect about MHC-class II molecules?

- a) They include HLA-DR, DP and DQ, and are expressed on APCs and B cells ✓
- b) They are required for CD4⁺ T cells differentiation into TH1, TH2, and TH17 ✓
- c) They bind directly to specific antigens on the surface of APCs
- d) They are involved in differentiation of B cells into plasma cells and memory B cells ✓
- e) c and d

11- Which of the following cells have the ability to secrete perforin and granzymes?

- a) Mature CD8⁺ T cells ✓
- b) NK cells
- c) Naïve CD4⁺ T cells ✓
- d) Monocytes
- e) a and b

12- Which of the following statement is incorrect?

- a) Plasma B cells are the main cells involved in humoral immune response ✓
- b) Naïve CD8⁺ T cells are able to act against cells expressed MHC-class I bound with antigen ✓ *→ 9A-200*
- c) Antibodies can function as antigen receptors on B cells or as effector molecules of the humoral immune response ✓
- d) Antibodies have a characteristic four-polypeptide structure consisting of two light chains and two heavy chains ✓
- e) b and c ✓

13- Which of the following is incorrect about regulatory T cells? *CD4⁺ + CD25*

- a) They are one subtype of CD3⁺ CD4⁺ T cells ✓
- b) They are characterized by the expression of CD25 molecule ✓
- c) They play a key role in immunosuppression mechanisms ✓
- d) They can inhibit the immune system activity by secreting IL-10 and TGF- β ✓
- e) None of the above ✓

14- Which of the following antibodies is predominant in body secretions as saliva? *^*

- a) IgG ✓
- b) IgA ✓
- c) IgD ✓
- d) IgM ✓
- e) IgE ✓

15- Which of the following is incorrect about Toll-like receptors (TLRs)?

- a) TLRs are involved in pathogen recognition by all innate immune cells ✓ *x except NK*
- b) TLR4 is a specific surface receptor for LPS ✓
- c) TLR3 and 7 are specific internal receptors for viral antigens ✓
- d) TLRs mediate the innate immune response by phagocytosis and cytokines production ✓
- e) None of the above ✓