

## Sample multiple choice questions

1.

Which of the following describes an activated dendritic cell upon arriving in a lymph node?

- a. Located in follicles and medulla of the lymph node
- b. Associated mainly with antigen uptake and processing
- c. Bears highly elaborated finger-like processes called dendrites
- d. Expresses low levels of MHC class II molecules
- e. Carries out apoptosis of lymphocytes.

2.

The area of contact between membranes of a T cell and an antigen-presenting cell where a clustering of protein–protein interactions occur is called a(n)

- a. immunoreceptor tyrosine-based activation motif (ITAM)
- b. polarization
- c. cross-presentation center
- d. granuloma
- e. immunological synapse.

3.

Which of the following is not produced by cytotoxic T cells?

- a. IFN- $\gamma$
- b. CD40 ligand
- c. TNF- $\alpha$
- d. lymphotoxin
- e. Fas ligand.

4.

Which of the following is the first stage of T-cell receptor gene rearrangement in  $\alpha$ : $\beta$  T cells?

- a. V $\alpha$   $\rightarrow$  D $\alpha$
- b. D $\alpha$   $\rightarrow$  J $\alpha$
- c. V $\beta$   $\rightarrow$  D $\beta$
- d. D $\beta$   $\rightarrow$  J $\beta$
- e. V $\alpha$   $\rightarrow$  J $\alpha$ .

5.

\_\_\_\_\_ of thymocytes is necessary to produce a T-cell repertoire capable of interacting with self-MHC molecules.

- a. Positive selection
- b. Negative selection
- c. Apoptosis
- d. Receptor editing
- e. Isotype switching.

**6.**

The human thymus begins to degenerate as early as one year after birth. This process is called \_\_\_\_\_ and is marked by the accumulation of \_\_\_\_\_ once occupied by thymocytes.

- a. thymectomy; dendritic cells
- b. involution; fat
- c. differentiation;  $\gamma$ : $\delta$  T cells
- d. negative selection;  $\gamma$ : $\delta$  T cells
- e. involution; thymic stroma.

**7.**

Which of the following characteristics is common to both T-cell receptors and immunoglobulins?

- a. Somatic recombination of V, D and J segments is responsible for the diversity of antigen-binding sites.
- b. Somatic hypermutation changes the affinity of antigen-binding sites and contributes to further diversification.
- c. Class switching enables a change in effector function.
- d. The antigen receptor is composed of two identical heavy chains and two identical light chains.
- e. Carbohydrate, lipid and protein antigens are recognized and stimulate a response.

**8.**

MHC class II molecules are made up of two chains called \_\_\_\_\_, whose function is to bind peptides and present them to \_\_\_\_\_ T cells:

- a. alpha ( $\alpha$ ) and beta ( $\beta$ ); CD4
- b. alpha ( $\alpha$ ) and beta<sub>2</sub>-microglobulin ( $\beta_2m$ ); CD4
- c. alpha ( $\alpha$ ) and beta ( $\beta$ ); CD8
- d. alpha ( $\alpha$ ) and beta<sub>2</sub>-microglobulin ( $\beta_2m$ ); CD8
- e. alpha ( $\alpha$ ) and beta ( $\beta$ );  $\gamma$ : $\delta$  T cells.

**9.**

MHC molecules have promiscuous binding specificity. This means that

- a. a particular MHC molecule has the potential to bind to different peptides
- b. when MHC molecules bind to peptides, they are degraded
- c. peptides bind with low affinity to MHC molecules
- d. none of the above describes promiscuous binding specificity.

**10.**

Which of the following cell types is not considered a professional antigen-presenting cell?

- a. macrophage
- b. neutrophil
- c. B cell
- d. dendritic cell
- e. all of the above are professional antigen-presenting cells.

**Answers:**

1. c
2. e
3. b
4. d
5. a
6. b
7. a
8. a
9. a
10. b