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-γ
   b. CD40 ligand
   c. TNF-α
   d. lymphotoxin
   e. Fas ligand.

4. Which of the following is the first stage of T-cell receptor gene rearrangement in α:β T cells?
   a. Vα → Dα
   b. Dα → Jα
   c. Vβ → Dβ
   d. Dβ → Jβ
   e. Vα → Jα.

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; γ:δ T cells
   d. negative selection; γ:δ 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 (α) and beta (β); CD4
   b. alpha (α) and beta2-microglobulin (β2m); CD4
   c. alpha (α) and beta (β); CD8
   d. alpha (α) and beta2-microglobulin (β2m); CD8
   e. alpha (α) and beta (β); γ:δ 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