Chapter 2

1. All blood cells in an adult human can trace their ancestry to which compartment within the body?

- **A.** Thymus
- **B.** Bone marrow
- **C.** Lymph node
- **D.** Peyer's patch
- **E.** None of the above

Answer: B

2. A pluripotent stem cell can do which of the following?

- **A.** Differentiate into a finite number of different cell types
- **B.** Differentiate into any type of cell found in the adult
- **C.** Divide an infinite number of times
- **D.** All of the above
- **E.** None of the above

Answer: A

3. Which of the following is the pluripotent stem cell that gives rise to all blood cells?

- **A.** CLP
- **B.** CMP
- **C.** CEP
- **D.** HSC
- **E.** None of the above

Answer: D

4. From which of the following stem cells are NK cells derived?

- **A.** CLP
- **B.** CMP
- **C.** CEP
- **D.** Both A and B
- **E.** None of the above

Answer: A

5. From which of the following stem cells are DCs derived?

- **A.** CLP
- **B.** CMP
- **C.** CEP
- **D.** Both A and B
- **E.** None of the above

Answer: D

6. From which of the following stem cells are platelets derived?

- **A.** CLP
- **B.** CMP
- **C.** CEP
- **D.** Both A and B
- **E.** None of the above

Answer: C

7. From which of the following stem cells are eosinophils derived?

- **A.** CLP
- **B.** CMP
- **C.** CEP
- **D.** Both A and B
- **E.** None of the above

Answer: B

8. From which of the following stem cells are helper T cells (T_H) derived?

- **A.** CLP
- **B.** CMP
- **C.** CEP
- **D.** Both A and B
- **E.** None of the above

Answer: A

9. From which of the following stem cells are monocytes derived?

- **A.** CLP
- **B.** CMP
- **C.** CEP
- **D.** Both A and B
- **E.** None of the above

Answer: B

10. From which of the following stem cells are RBCs derived?

- **A.** CLP
- **B.** CMP
- **C.** CEP
- **D.** Both A and B
- **E.** None of the above

Answer: C

11. What level of gene expression is regulated by such factors as Notch1, GATA-2 and *Bmi-1*?

- **A.** Replication
- **B.** Transcription
- **C.** RNA processing
- **D.** Translation
- **E.** None of the above

Answer: B

12. Which lineage of immune cells constitutes the first line of defense against an infection?

- **A.** Lymphoid
- **B.** Erythroid
- **C.** Myeloid
- **D.** All of the above
- **E.** None of the above

Answer: C

13. Which of the following is NOT descended from the common lymphoid progenitor?

- **A.** T cells
- **B.** NK cells
- **C.** B cells
- **D.** Eosinophils
- **E.** All of the above are descended from the common lymphoid progenitor.

Answer: D

14. Which of the following granulocytes contains histamine within its granules?

- **A.** Neutrophils
- **B.** Eosinophils
- **C.** Basophils
- **D.** Both B and C
- **E.** All of the above

Answer: C

15. Which of the following is NOT true about monocytes?

- **A.** They comprise between 5–10% of circulating leukocytes.
- **B.** They have the ability to differentiate into macrophages or dendritic cells.
- **C.** They can be subdivided into inflammatory monocytes and patrolling monocytes.
- **D.** They can give rise to platelets.
- **E.** All of the above are true.

Answer: D

16. Which of the following cell types is responsible for the secretion of immunoglobulins?

- **A.** T_H1
- **B.** T_H2
- **C.** T_H17
- **D.** T_{FH}
- **E.** Plasma cell

Answer: E

17. Which of the following cell types is responsible for regulating responses against intracellular pathogens?

- **A.** T_H1
- **B.** T_H2
- **C.** T_H17
- **D.** T_{FH}
- **E.** Plasma cell

Answer: A

18. Which of the following cell types is responsible for activating B cells in germinal centers?

- **A.** T_H1
- **B.** T_H2
- **C.** T_H17
- **D.** T_{FH}
- **E.** Plasma cell

Answer: D

19. Which of the following cell types is responsible for regulating responses against predominantly extracellular pathogens?

- **A.** T_H1
- **B.** T_H2
- **C.** T_H17
- **D.** T_{FH}
- **E.** Plasma cell

Answer: B

20. Which of the following cell types secretes IL-17 and may play a role in anti-fungal responses?

- **A.** T_H1
- **B.** T_H2
- **C.** T_H17
- **D.** T_{FH}
- **E.** Plasma cell

Answer: C

21. Which of the following effector T lymphocyte populations is produced via the activation of a naïve T cell through antigen presented in MHC Class I?

- **A.** CTL
- **B.** T_H1
- **C.** T_H2
- **D.** T_H17
- **E.** None of the above

Answer: A

22. Which of the following types of effector T lymphocytes is capable of inhibiting an immune response to an antigen recognized with its T-cell receptor (TCR)?

- **A.** T_H1
- **B.** T_{reg}
- **C.** T_H2
- **D.** T_H17
- **E.** None of the above

Answer: B

23. Which of the following descendants of the CLP act in the innate immune response?

- **A.** T cells
- **B.** NK cells
- **C.** B cells
- **D.** Plasma cells
- **E.** All of the above

Answer: B

24. Which of the following is NOT considered primary lymphoid tissue?

- **A.** Draining lymph node
- **B.** Thymus
- **C.** Peyer's patch
- **D.** Choices A and C are not primary lymphoid tissue.
- **E.** None of the above is primary lymphoid tissue.

Answer: D

25. In mammals, T-cell development occurs in the _____, while B-cell development occurs predominantly in the _____.

- **A.** thymus; bursa of Fabricius
- **B.** bone marrow; mesenteric lymph nodes
- **C.** bone marrow; thymus
- **D.** thymus; bone marrow
- **E.** None of the above

Answer: D

26. As thymocytes develop, they are classified on the basis of the state of their T-cell receptors and which of the following?

- **A.** Which class of MHC they express on their surface
- **B.** The state of the immunoglobulin heavy and light chains on their surface
- **C.** The presence of coreceptor proteins CD4 and CD8 on their surface
- **D.** The expression of the transcription factor, FoxP3
- **E.** None of the above

Answer: C

27. Upon entering the thymus, thymocytes are classified as double _____ with regard to coreceptor; before exiting as single-positive, naïve T cells, they pass through a period in which they are double _____.

- **A.** positive; negative
- **B.** negative; positive
- **C.** Both of these are true.
- **D.** Neither of these are true.
- **E.** Coreceptor expression state does not change in the thymus.

Answer: B

28. Contraction of which of the following types of muscles is responsible for propulsion of lymph through the lymphatic system?

- **A.** Cardiac
- **B.** Skeletal
- **C.** Smooth
- **D.** Both B and C
- **E.** None of the above

Answer: D

29. Naïve lymphocytes enter secondary lymphoid tissues via which of the following structures?

- **A.** Afferent lymphatics
- **B.** Efferent lymphatics
- **C.** HEVs
- **D.** Marginal sinus
- **E.** None of the above

Answer: C

30. Which of the following does NOT appear to utilize the FRCC system as its primary means for trafficking through the lymph node?

- **A.** B cells
- **B.** T cells

- **C.** Free antigen that entered via an afferent lymphatic
- **D.** Cytokines and chemokines
- **E.** None of the above utilizes the FRCC system.

Answer: A