Welcome to the FIT Board Review Corner, prepared by Timothy Chow, MD, and Christopher Foster, MD, senior and junior representatives of the College's Fellows-in-Training (FITs) to the Board of Regents. The FIT Board Review Corner is an opportunity to help hone your Board preparedness.

Review Questions
Allergy and Immunology Review Corner: Janeway's Immunobiology, 9th edition

Chapter 10: Humoral Immunity

1. Naïve T cells express which of the following chemokine receptor in order to localize to a specific zone within the lymph node?
    a. CXCR5
    b. CCL19
    c. CCR7
    d. CXCL13

2. A 12-year-old boy with fulminant hepatitis due to EBV infection and pancytopenia has a defect in which gene?
    a. CD40 ligand
    b. Signaling lymphocyte activation molecule-associated protein (SAP)
    c. ICOS ligand
    d. Activation-induced cytidine deaminase (AID)

3. Which of the following B cell maturation steps is impaired in ataxia telangiectasia due to a mutation in the ATM gene?
    a. Somatic hypermutation
    b. Affinity maturation
    c. Class switching
    d. Development into a plasmablast

4. Deficiency of which ligand found on which cell results in hyper IgM syndrome?
    a. CD40 on T cells
    b. CD40 on B cells
    c. CD40 ligand on T cells
    d. CD40 ligand on B cells

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5. Which IgG subclass does not play a role in complement activation?
    a. IgG1
    b. IgG2
    c. IgG3
    d. IgG4

6. The selective transport of IgG across the placenta is due to which receptor?
    a. Poly Ig receptor
    b. Neonatal Fc receptor
    c. Complement receptor 2
    d. Fc receptor

7. Antibody-dependent cell-mediated cytotoxicity is triggered when antibody bound to the surface of a cell interacts with which Fc receptor on the NK cell?
    a. FcγRI
    b. FcγRIII
    c. FcεRI
    d. FcεRII

8. A plasma cell has which of the following characteristics?
    a. Undergoes class switching
    b. High rate of immune globulin secretion
    c. Undergoes somatic hypermutation
    d. High rate of immune globulin expression

9. The B cell co-receptor complex is made of which of the following cell-surface proteins?
    a. CD19, CD21, CD81
    b. CD19, CD20, CD86
    c. CD20, CD21, CD80
    d. CD16, CD20, CD80

10. A 15-month-old boy presents with a history of recurrent *haemophilus influenzae* infections, eczema, thrombocytopenia, and a history of bleeding after circumcision. What is the most likely diagnosis?
    a. X-linked lymphoproliferative syndrome
    b. Hyper IgM syndrome
    c. Ataxia telangiectasia
    d. Wiskott-Aldrich syndrome

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Answers:

1. **c** (page 403): Naïve T cells express the chemokine receptor CCR7 and localize to zones where its ligands, CCL19 and CCL21, are highly expressed within the lymph node.
2. **b** (page 406): In X-linked lymphoproliferative syndrome, the SAP gene is inactivated, and patients can have an exaggerated immune response to EBV.
3. **c** (page 417): Class switching is sometimes impaired in ataxia telangiectasia, which is caused by mutations in the DNA-PKcs-family kinase, ATM, a known DNA repair protein.
4. **c** (page 418): Genetic deficiency of CD40 ligand on activated helper T cells reduces class switching and results in abnormally high levels of plasma IgM, a condition known as hyper IgM syndrome.
5. **d** (page 423): IgG1 and IgG3 strongly activate complement, and IgG2 weakly activates complement. IgG4 does not activate complement.
6. **b** (page 426): The selective transport of IgG from mother to fetus is due to an IgG transport protein in the placenta, FcRN (neonatal Fc receptor).
7. **b** (page 435): NK cells express FcγRIII (CD16) which recognizes IgG1 and IgG3 subclasses and destroys antibody-coated target cells in a process called antibody-dependent cell-mediated cytotoxicity (ADCC).
8. **b** (page 407): A plasma cell produces large amounts of secreted antibody.
9. **a** (page 402): The B cell co-receptor complex contains the cell-surface proteins CD19, CD21 (or complement receptor 2), and CD81.
10. **d** (page 421): Wiskott-Aldrich syndrome is caused by defects in T cells that impair their interaction with B cells and lead to increased susceptibility to encapsulated bacteria such as *H. influenzae.*

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