BIO 2402 - Human Anatomy & Physiology
Week 9 Resource

This week we will be covering chapters 27 and 28 over the lymphatic and the body's defense systems. The body's defense is primarily word association, with the exception of B cells and T cells and their role in cellular immunity. For the lymphatic system you will want to be able to word associate different structures and functions with the portions of the system.

Remember that the Tutoring Center offers free individual and group tutoring for this class. Our Group Tutoring sessions will be every Wednesday from 6:00-7:00 PM CST. You can reserve a spot at https://baylor.edu/tutoring.

KEY TERMS: Antibody, Complement, Lymph node, T cell activation, B cell activation

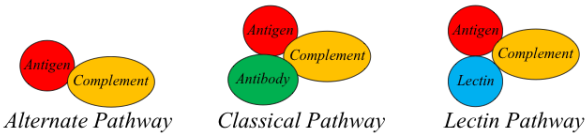
Complement: a type of plasma protein involved in *nonspecific defense* that circulates in the blood in an inactive form. When activated, complements help destroy various types of foreign particles.

Classical pathway: most common method. Inactive complement protein binds to an *antigen-antibody complex*.

Alternative pathway: least common method. Specific complement protein binds directly to an antigen.

Lectin pathway: protein *lectin* binds with a sugar (mannose or glucose) on the surface of a foreign particle.

Methods of Activating Complement Proteins



Antibody: a type of plasma protein that is involved in *specific defense* and B cell/T cell activation.

Below is a chart that compares the functions of a complement and an antibody. These plasma proteins do perform some similar functions, and it will be important to know which functions they share and what makes them different.

All images are taken from Dr. Taylor's textbook

Action	Complement	Antibodies
Direct lysis	√	
Chemotaxis	√	√
Enhance inflammation	√	√
Opsonization	√	√
Activation of Complement	√*	√**
Agglutination		√
Precipitation		√
Neutralization		√
Form protective coverings		√

Specific defense mechanisms include Macrophages, Tc, Th, and B cells.

Tc Cells: function in cell mediated immunity. Word association: TCR, MHC-1, CD8, and APCs

Th cells: plays a role in humoral immunity. Word association: CD4, MHC-II, APCs, Macrophages.

B cells: plays a role in humoral immunity. Word association: B cell receptor, free antibody, MHC-II.

In the following diagrams you want to identify each cell described above and each term

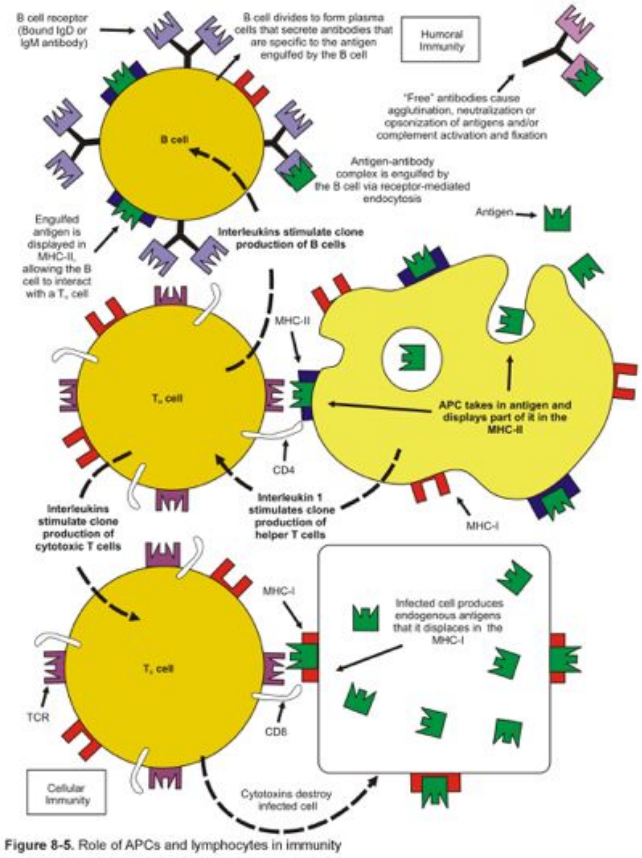


Figure 8-5. Role of APCs and lymphocytes in immunity

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that is associated with them. Talk through the steps of humoral and cell mediated immunity to yourself

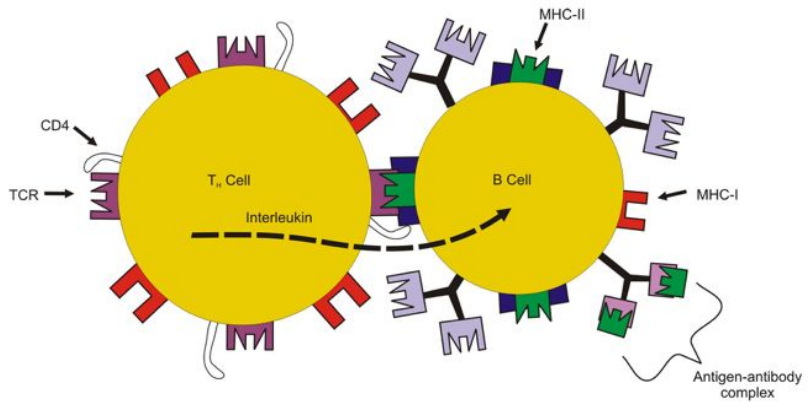

Figure 8-5. Role of T_H cell in B cell activation

Lastly, I want to briefly mention different types of allergic reactions. There are four types of allergic reactions that you will need to know, including the possible symptoms that result.

a. Type I/Acute → IgE/reagins + mast cell = degranulation
    i. Watery eyes, hives, asthma
b. Type II/Cytoxic → lyses cell, blood agglutination
c. Type III/Immune complex → mold
d. Type IV/Delayed hypersensitivity → poison ivy rash, late due to Helper T cells & macrophages

Lymphatic system → For the lymphatic system you want to primarily focus on word association. I have created an outline of terms that you will want to associate with structures.

1. Lymphatic Vessels
    a. Lymphatic Capillaries
        i. Close ended
        ii. Anchoring filaments
        iii. Lacteals (for chylomicrons- extremely low density lipoproteins)
    b. Small Lymphatic Vessels
        i. Similar to veins w/valves and tunics
    c. Lymphatic Trunks: JIBLS

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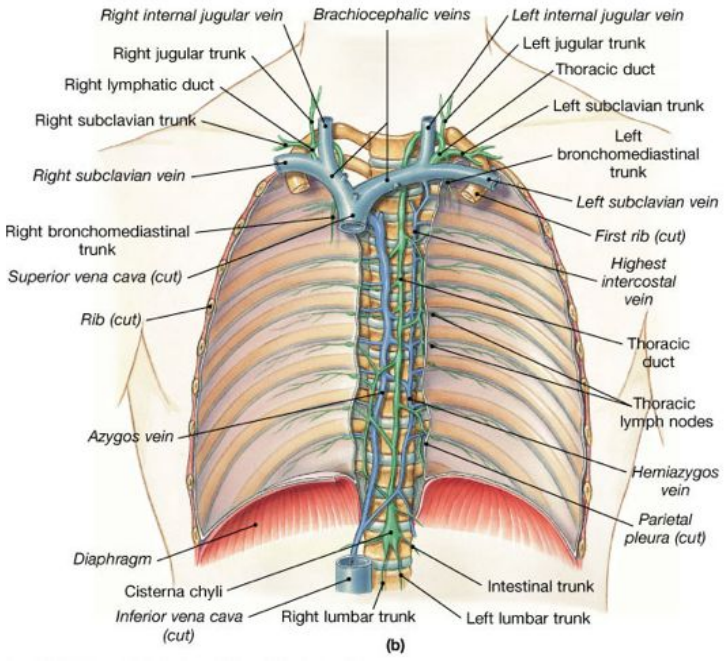
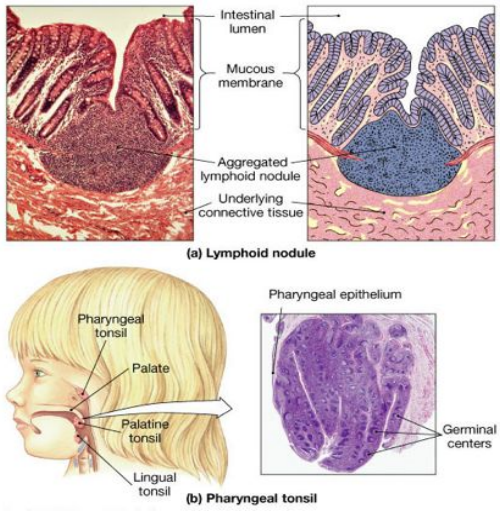
i. Jugular
ii. Intestinal
iii. Bronchomediastinal
iv. Lumbar
v. Subclavian

d. Lymphatic Ducts
i. Left/Thoracic
1. Cisterna chyli at the base, collects byproducts of lacteals
ii. Right
1. VERY SMALL
a. R. broncho, subclavian, and jugular



2. Lymph
a. Tissue fluid that enters lymph capillaries instead of blood capillaries

3. Lymph Nodules
a. Unencapsulated, w/germinal centers
i. Pharyngeal tonsils/Adenoids
1. Crypts: trap bacteria
ii. Palatine tonsils
iii. Lingual tonsils
iv. Tubal tonsils
v. MALT
vi. Peyer's patches



4. Lymphoid Organs
i. All are encapsulated w/trabeculae & germinal centers
ii. Lymphocytes & macrophages

b. Lymph Nodes: mnemonic device: ILIAC
i. Filters lymph
ii. Afferent/Efferent vessels, follicles, germinal centers

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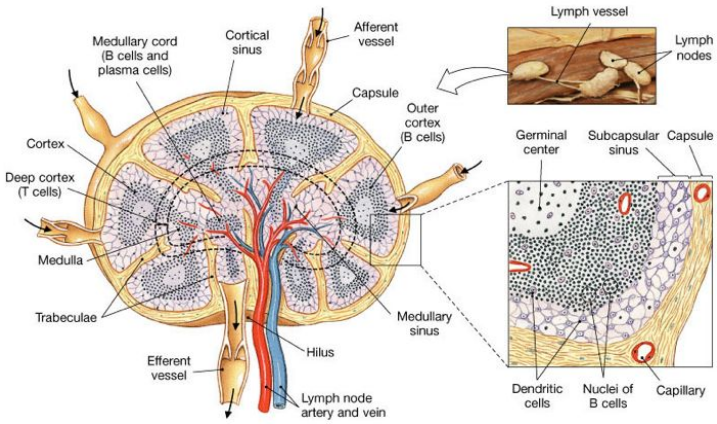
1. Intestinal
2. Lumbar
3. Inguinal
4. Axillary
5. Cervical

To the right is an image of a typical lymph node with afferent/efferent vessels, follicles, and germinal centers labeled. Make sure that you can identify the different structures for the lab midterm.



c. Spleen: FILTERS BLOOD
    i. Red pulp: reticular fibers, sinusoids, and aggregation of RBCs
    ii. White pulp: “islands” reticular fibers & lymphocytes
d. Thymus: Maturation site for T lymphocytes
    i. Thymosin stimulates activity
    ii. More important for children

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