

## Lesson 6 - Main Terms

UNIT	TERM	EXPLANATION
6.1	<b>BCR (B-cell Receptor)</b>	The B-cell receptor is a transmembrane receptor found on the outer surface of B cells. The BCR is in essence a membrane bound antibody comprised of two heavy chains that extend and anchor the BCR to the membrane and two light chains that bind to the two heavy chains.
6.1	<b>immunoglobulin</b>	An alternative term for antibody. Immunoglobulins refer to soluble antibodies and not to the membrane bound BCR.
6.1	<b>heavy chain</b>	The large (or heavy) polypeptide subunit of an antibody. Heavy chains typically are made of 450-550 amino acids. The specific heavy chain defines the type of antibody molecule, i.e., IgM, IgG, IgA and IgE.
6.1	<b>light chain</b>	The small (or light) polypeptide subunit of an antibody (about 220 amino acids long).
6.1	<b>(antigen) binding site</b>	A region on the antibody that binds antigens. Typically, an antibody monomer has two identical binding sites. IgM molecules are made of 5 monomers (a pentameric structure) and thus contain 10 binding sites, IgG has two binding sites.
6.1	<b>(antibody) effector signal</b>	The Carboxy end of an antibody's heavy chains forming a "stalk" that can interact with different immune cells by an Fc Receptor.
6.1	<b>epitope</b>	The specific surface of an antigen that is directly recognized by an antibody for example.

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6.1	<b>clonal expansion</b>	A process in which thousands of daughter cells are generated from a single cell, in response to antigen binding.
6.1	<b>IgM</b>	A type of antibody comprised of five antibody monomers linked together. IgM is the first antibody to be secreted by a B-cell in response to interacting with its corresponding antigen.
6.1	<b>IgG</b>	The most common type of antibody found in the blood.
6.1	<b>IgA</b>	A type of antibody comprised of two antibodies monomers linked together and mainly found in the mucosa.
6.1	<b>IgE</b>	The least common type of antibody. Plays a role in fighting off parasites. IgE is bound by mast cells. Binding of its antigen triggers histamine release by the mast cell. IgEs are central to the allergic response.
6.2	<b>cross reactivity (antibody)</b>	The antibody's ability to recognize and bind an antigen slightly different from the original antigen that stimulated the B-cell in the first place.
6.3	<b>MHC</b>	A family of cell surface complexes found on most of the cells of our body. The MHC binds peptides that are generated by the proteasome and displays these peptides on the surface of the cell. This system constantly presents samples of the proteins being produced in given cell and thus functions as the quality control system of the body. The peptides presented via MHC are screened by T-cells. When viral proteins are displayed by

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		MHC, T-cells identify the MHC/viral-peptide complex by the T-cell receptor and knock out the infected cell.
6.3	<b>TCR (T-cell Receptor)</b>	A receptor found on the T-cell membrane. The TCR recognized the MHC and is able to discriminate between self vs non-self peptides. When the MHC displays non-self peptides and is bound by the TCR, this triggers the TCR to kill the infected cell.
6.3	<b>NK cell (Natural Killer cell)</b>	A special type of lymphocyte that is able to detect infected cells and knock them out.
6.4	<b>mast cell</b>	A special type of immune cell that is rich in histamine containing granules. Mast cells have TLR and Fc receptors, especially Fc receptors that bind the effector signal of IgE molecules. Thus mast cells are decorated by many different types of IgEs. When these bind to their corresponding antigens, the mast cell releases histamine which leads to a violent immune response.
6.4	<b>allergens</b>	The antigen that causes an allergic response.
6.5	<b>immunodeficiency</b>	A state in which the immune system is compromised and is unable to defend the body against pathogens and cancer.
6.5	<b>leptin</b>	A hormone produced by fat cells that among other functions, is important for the development of T-cells.
6.5	<b>SCID (Severe Combined Immunodeficiency)</b>	A genetic disorder in which the development of T and B cells is compromised resulting in a dysfunctional immune system.

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6.5	<b>HIV (Human Immunodeficiency Virus)</b>	A retrovirus that causes AIDS.
6.5	<b>AIDS (Acquired Immuno- Deficiency Syndrome)</b>	The immunodeficiency caused by HIV.
6.5	<b>reverse transcriptase</b>	A non-structural polymerase of retroviruses. This enzyme uses the viral RNA template to produce a double stranded DNA copy of the viral genome – the pro-virus.