**Immunology**

**Study Guide for Exam 2**

* Review all Powerpoints
* Review all chapters, review questions at the end of chapters
* Review Immunoglobulin Gene Rearrangement
	+ How does it occur?
	+ Antibodies
		- Are heavy and light chain genes on the same chromosome?
		- Do heavy or light chains rearrange first?
		- Do light chains have VDJ segments or just VJ segments?
		- What is the order of constant chain segments?
		- Remember that mRNA processing creates the difference between secreted Ab and membrane-bound Ab
		- What is allelic exclusion?
		- What are the 7 ways are antibody diversity generated?
	+ TCR
		- Is there somatic hypermutation like with Ab rearrangement? Why?
		- Review positive and negative selection in the thymus
* Review B cell development
	+ At what stages do you find gene rearrangement? Expression of IgM? Expression of IgD? Class switching?
	+ What is the antigen independent phase? Antigen dependent phase?
	+ What are 3 events that happen to B cells in germinal centers in secondary lymphoid tissue?
	+ What are thymus dependent antigens? Know what B-2 B cells are. What are thymus-independent antigens? Know what B-1 B cells are
	+ What is central tolerance? What is peripheral tolerance?
* Review MHC
	+ What is haplotype?
	+ Which MHC reacts with what population of T cells?
	+ On what cells do you find Class I MHC? Class II MHC?
	+ Antigen presentation – review both the endogenous and exogenous pathways
		- Which pathway occurs in infected cells?
		- What are proteasomes?
		- What is the CLIP?
	+ Review structure of MHC I and MHC II
	+ Review MHC restriction
* Review T cells
	+ what does it mean to be double negative? Double positive? Is CD4 found on Tc or TH cells? Is CD8 found on Tc or TH cells? What is the function of a cytotoxic T cell (CTLs)?
	+ Review how they kill cells (perforin, Fas-FasL pathway) What is the function of a T helper cell?
	+ What is an APC? What is a target cell?
* What is IL-2? What is IL-2R? What are co-stimulatory molecules? What are co-inhibitory molecules?
* What are superantigens?
* Be able to distinguish between antibody, TCR, Class I MHC, Class II MHC structures
* Be able to understand and answer questions on the following:

