Covered in Last Lecture

✓ Innate System
✓ 4 Properties of Acquired System:
  1. Diversity
  2. Specificity
  3. Self vs non-Self
  4. Memory

Antibody Structure:
- 2 Heavy chains
- 2 Light chains
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✓ Generating Diversity - V(D)J recombination
  DNA re-arrangements of Heavy Chain Gene

T Cell Receptor - TCR

α Chain
β Chain

Variable regions
Constant regions

Inside T cell
Outline of the Human Immune System

Pathogen

Innate

non-specific

skin proteins (lysozyme)

small molecules ($H_2O_2$)

Humoral (foreigners)

B Cells

Antibodies

macrophages

Acquired

specific

Cellular (body cells gone bad)

$T_b$ Cells

$T_c$ Cells

$T_x$ Cells

T Cell Receptors

How would you engineer a system to fight invaders?

Would need:

Cells to recognize invader
  - need to recognize specifically
  - must not recognize self

Cells to destroy invader
  - must have many of these

Memory

Common Abbreviations

$T_H$ = T Helper Cell

$T_C$ = T Cytotoxic Cell

Ab = Antibody

Ag = Antigen

TCR = T Cell Receptor

MHC = Major Histocompatibility Complex

Structure of MHC$^*$ I & II

$I$ $II$

$^*$ = Major Histocompatibility Complex