Jeremy's Super-Duper 7.012 Immunology Quiz

Nomenclature

Foreign stuff in the body is called ___________.

The proteins we make that recognize this foreign stuff are called ___________.

The particular region of this foreign stuff that these proteins recognize is called the ___________.

Overview of Immune System

There are two wings of the immune system:

1. The __________ immune system (involves Abs, B cells)

2. The __________ immune system (involves Tc cells)

A Few Words About Antibodies (Abs)

Cells that make antibodies are called ____ cells (they develop in the ____ ________).

Antibodies consist of ____ polypeptide chains: 2 _______ chains and 2 _______ chains.

These chains are held together by ________________ ____.

Heavy chains are formed by ___ - ___ - ___ recombination.

Light chains are formed by ___ - ___ recombination.

Each Ab has ___ Ag-binding regions/domains.

Humoral Immunity

Macrophages can ingest ("phagocytose") Ag, degrade it into oligopeptides in the ________,

and then display them on the cell surface in conjunction with ________________ proteins.

[Note: Only macrophages and ____ cells possess these surface proteins.]

The Ag/_______ complex can interact with a _________. cell (they develop in the ________) via

this cells surface protein, the ______________.
[Note: Recombination/diversity in production is analogous to that in Ab production.]

This macrophage/T-helper cell interaction “activates” the T-helper cell to release the cytokine

This cytokine acts on the same T-helper cell (autocrine signalling) and stimulates proliferation to form a ______ of activated T-helper cells (all with the same surface ______ protein).

Now suppose a B-cell (with surface Abs) recognizes this same Ag. The Ag/Ab complex will be

_________________, degraded into _______________ in the ____________, and displayed in conjunction with a surface ___________ protein.

[Note: Macrophages and B cells that present Ag in this way are often called ________________

_____________________ ____ (APCs).

This B-cell interacts with “activated” T-helper cell (from clone above) via the T-cell receptor.

This causes the T-helper cell to release ____________. These stimulatory molecules cause the B cell to _______________ and _______________ into two types of cells:

MEMORY cells and PLASMA cells.

Plasma Cells

Plasma cells have a higher number of ____________ and much more ____________

_________________ than regular cells --- they are (secreted) Ab-producing ____________!

[Note: Macrophages have an affinity for the constant regions of Abs.]

Memory Cells

Memory cells divide slowly and have the same surface Ab... this allows the body to

“remember” Ag. Genes in these cells can undergo ____________ ____________ ____________

of hypervariable regions which may increase Ab affinity for Ag.
[Note: Because of plasma and memory cells, secondary response to an Ag is _________ and _________ than the first infection.

**Cellular Immunity**

All cells in the body have surface proteins called _____________ via which they constantly display fragments of proteins derived from _________________________.

Thus, when a cell is infected with a virus, some of the fragments displayed by the infected cell will be derived from _______ _____________.

The type of T cell that recognizes Ag bound to MHC I is the _____________ cell.

[Note: These cells contain T-cell receptors just like T-helper cells.]

Interaction with Ag/MHC I “activates” cytotoxic T cell, causing proliferation to form a ______ of activated Tc cells.

When such an activated Tc cell recognizes the same Ag/MHC I again, it ______ the infected cell by releasing the molecule __________ which “pokes holes” in the cell’s ___________.