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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 cell's 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 _____.