Humoral vs. Cell Mediated Immunity

Humoral Immunity	Cell Mediated Immunity
B lymphocytes main players	T lymphocytes main players
Fights bacteria & viruses, most effective before viruses enter body cells	Fights fungi, parasites, virus infected cells, cancer cells, foreign tissues(transplants)
Uses circulating antibodies	Uses cells that attach to invaders and destroy
Location of B cell processing is bone marrow(Bursa of Fabricius in birds)	T cells are processed in the thymus
Macrophages process the antigens and present parts of them to B cells	Macrophages process the antigens and present parts of them to T cells

A Comparison of B and T Cells

B Cells	T Cells
There are B cells for each antigen/antibody	There are T cells for each antigen/antibody
	Most are inactive at any given time
B cells are activated when presented with the proper antigen by macrophages	T cells are activated when presented with the proper antigen by macrophages
B cells clone themselves and develop into several subtypes after being activated	T cells clone themselves and develop into several subtypes after being activated
Plasma cells are B cell clones that proliferate and secrete antibodies	Killer T cells directly attack invades and punch holes in their membranes; they also secrete lymphokines and lymphotoxins that help fight the invaders

	Helper T cells work with B cells to increase antibody production and secrete interleukin
	Suppresser T cells shut down the immune response after the infection
Memory B cells "remember" the antigen and initiate a quick response if the antigen is detected again	Memory T cells "remember" the antigen and initiate a quick response if the antigen is detected again(secondary response)

Other important players in the immunity game

Antigen Processing Cells(APCs)- Macrophages that process and display foreign protein fragments(antigens)

Clonal selection- Clones (copies) of T and B cells produced in response to one antigen, clones allow for buildup of large populations of immune system cells.

Lymph Nodes- Act as filters for lymph, B and T cells work here and produces lymphocytes.

Macrophages- Eat(phagocytize) invaders and present bits of the proteins(antigens) to B and T cells.

MHC(Major Histocompatibility Complex)- A biochemical "fingerprint" of an individual's cells, used to recognize "self" from invaders(antigens).

Natural Killer(NK) cells- Destroy invading cells by lysis and produce interferon; destroy cancer cells(any cells that lack a critical MHC molecule fragment)

Spleen- Large mass of lymphatic tissue, produces B cells, destroys old red blood cells and stores blood.

Thymus Gland- Site where T cells are processed(this is why they are called T cells)

References

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Return to WInter Wren AP Biology HomePage

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