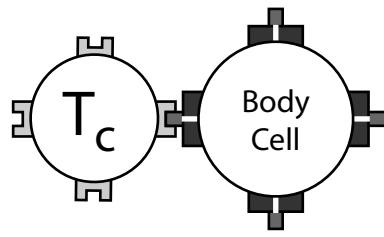


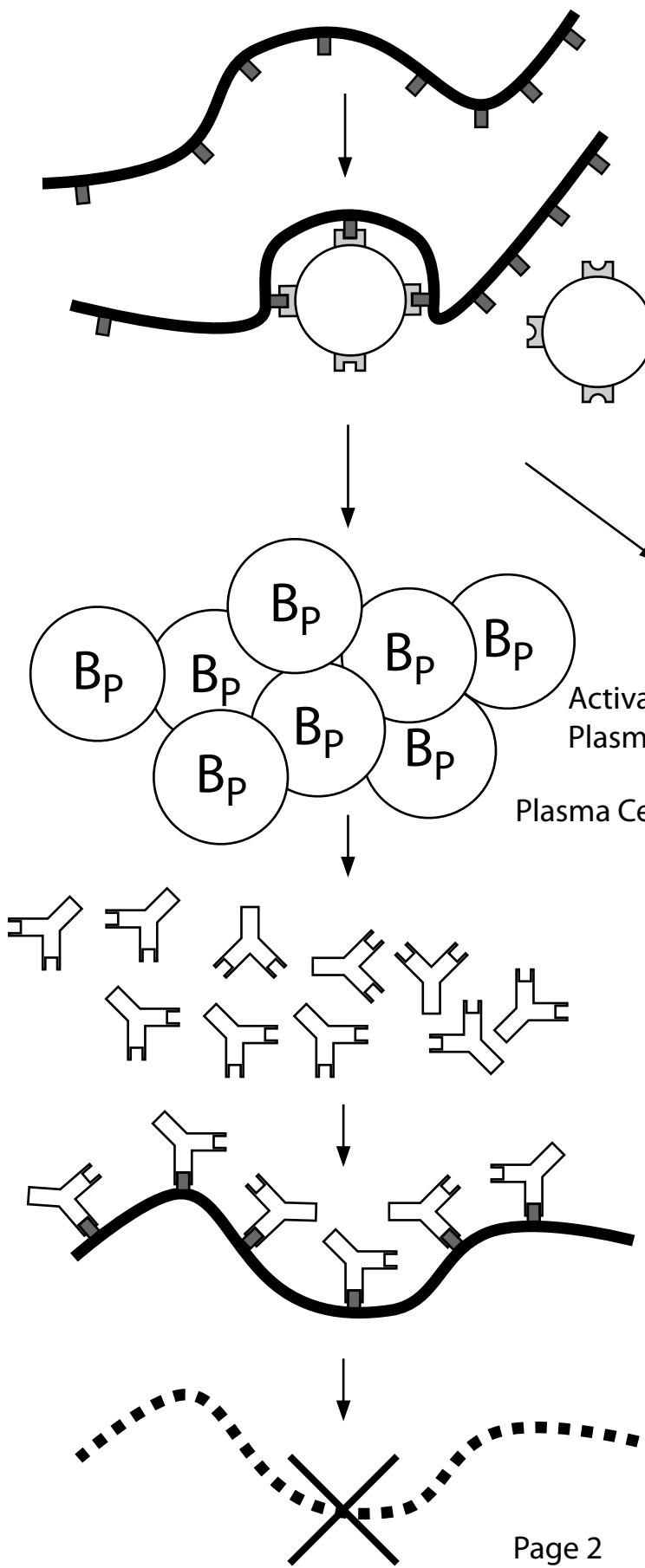
Adaptive Immunity

A pictoral guide to
Humeral Immunity
and
Cellular Immunity



By Noel Ways

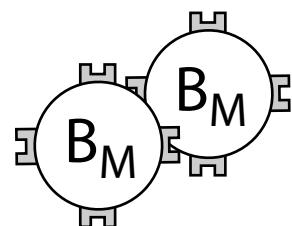
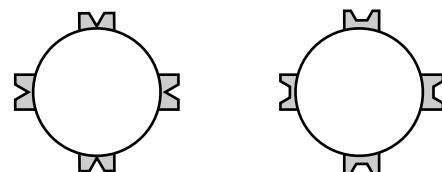
Humoral Immunity (T-independent antigens)



Pathogen with antigen present in body.
Antigen is usually carbohydrate.

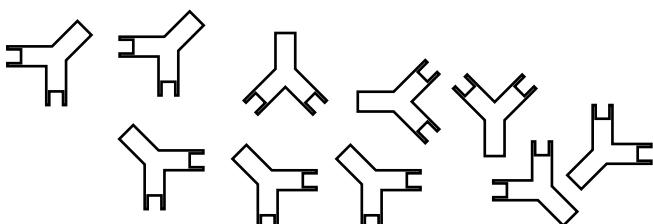
Immunocompetent B Cell binds multiple times with antigen.

Immunocompetent B Cells



Activated B Cell divides and differentiates into Plasma B Cells (B_P) and Memory B Cells (B_M).

Plasma Cells clonally proliferate.



Plasma B cells mass produce antibodies.

Antibodies enter into circulation and bind to antigens on pathogen forming antibody-antigen complexes.

Antibody - antigen complexes "mark" pathogen for a vigorous attack.

The pathogen is destroyed.

Humeral Immunity (T-dependent antigens)

Immunocompetent B cell specific for antigen binds to antigen. Pathogen is then ingested by receptor mediated endocytosis.

Cellular Immune response activates immunocompetent Helper T Cell (T_H).

Plasma Cells clonally proliferated and mass-produce antibodies (), which bind to antigen / MHC Class II Complex () marking pathogen destruction.

Plasma Cells are instructed to apoptose when their job is done.

Pathogen with antigen present in body

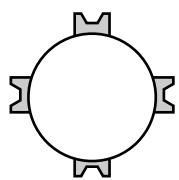
Antibodies bind to antigen and "mark" the pathogen to be destroyed

Antigen processing occurs and the antigen (Δ) is presented on cell surface in conjunction with MHC class II ($\blacksquare\blacksquare$).

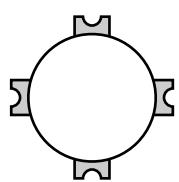
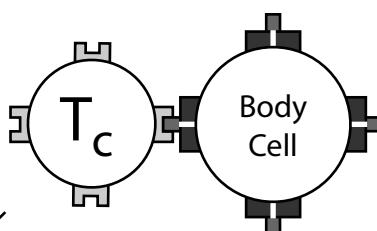
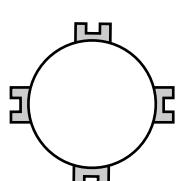
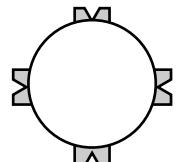
Activation proceeds with immunocompetent T_H recognition, binding, and secretion of Cytokines. B Cell divides and differentiates into Plasma B Cells and Memory B Cells.

Long lived Memory B Cells can mount a quick response against subsequent infections by same antigenic pathogen.

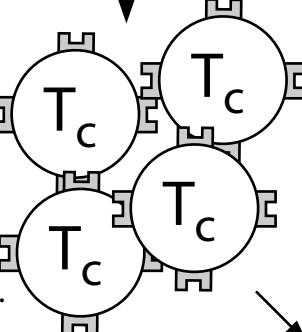
Cellular Immunity I



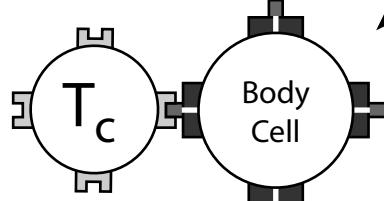
Different Immunocompetent Cytotoxic T Cells (T_c)



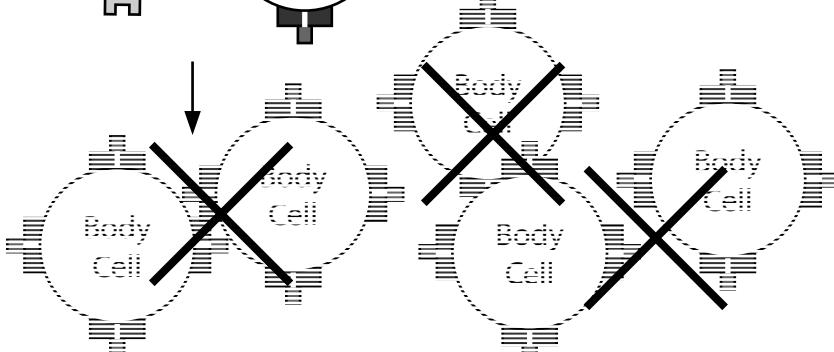
Immunocompetent T_c cell recognizes protein as "FOREIGN" and is activated by binding to the antigen / MHC class I complex ().



Cytotoxic killer T cell clonally proliferates.

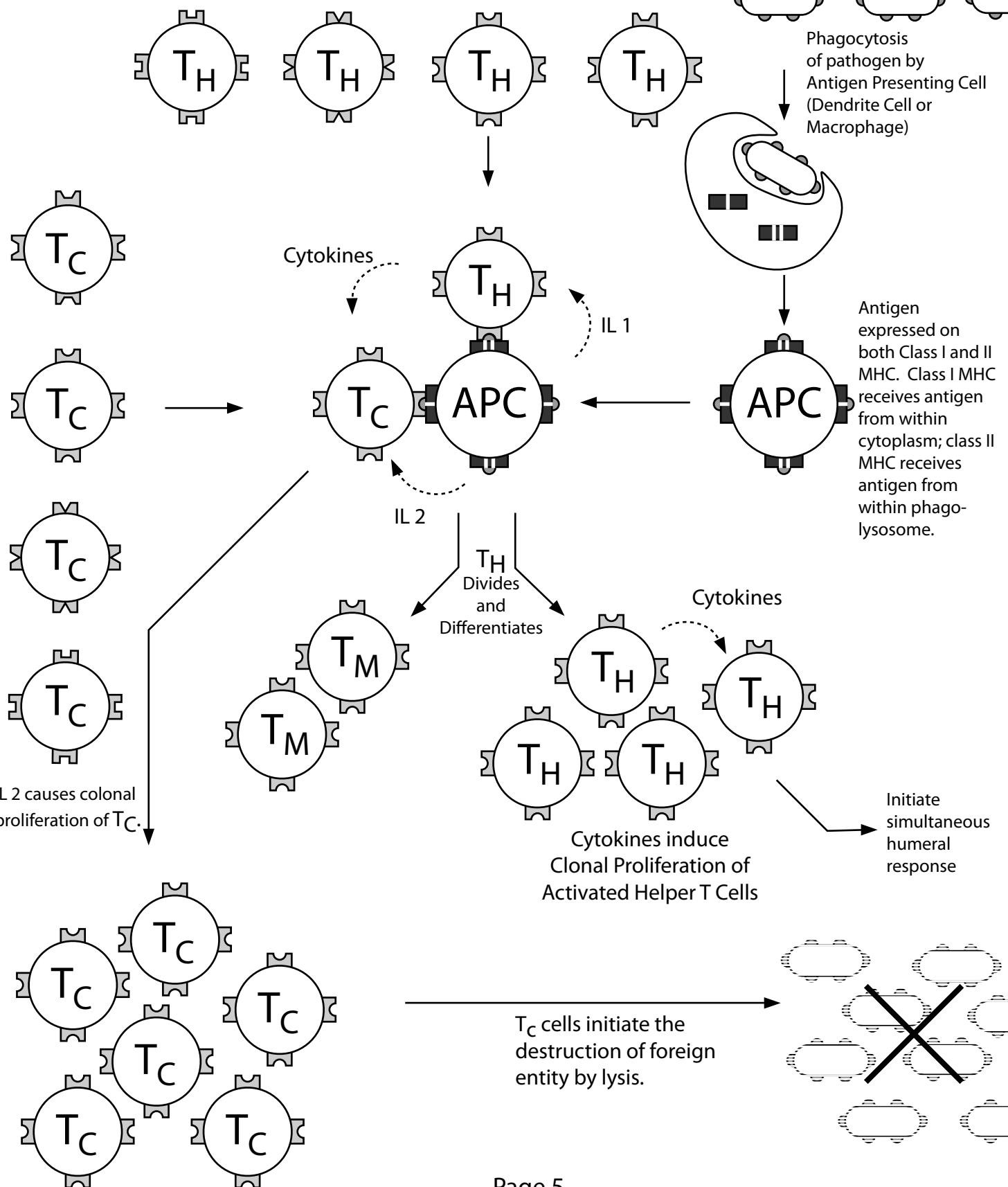


Cloned Cytotoxic T cells binds to cells displaying non-self proteins (antigens).



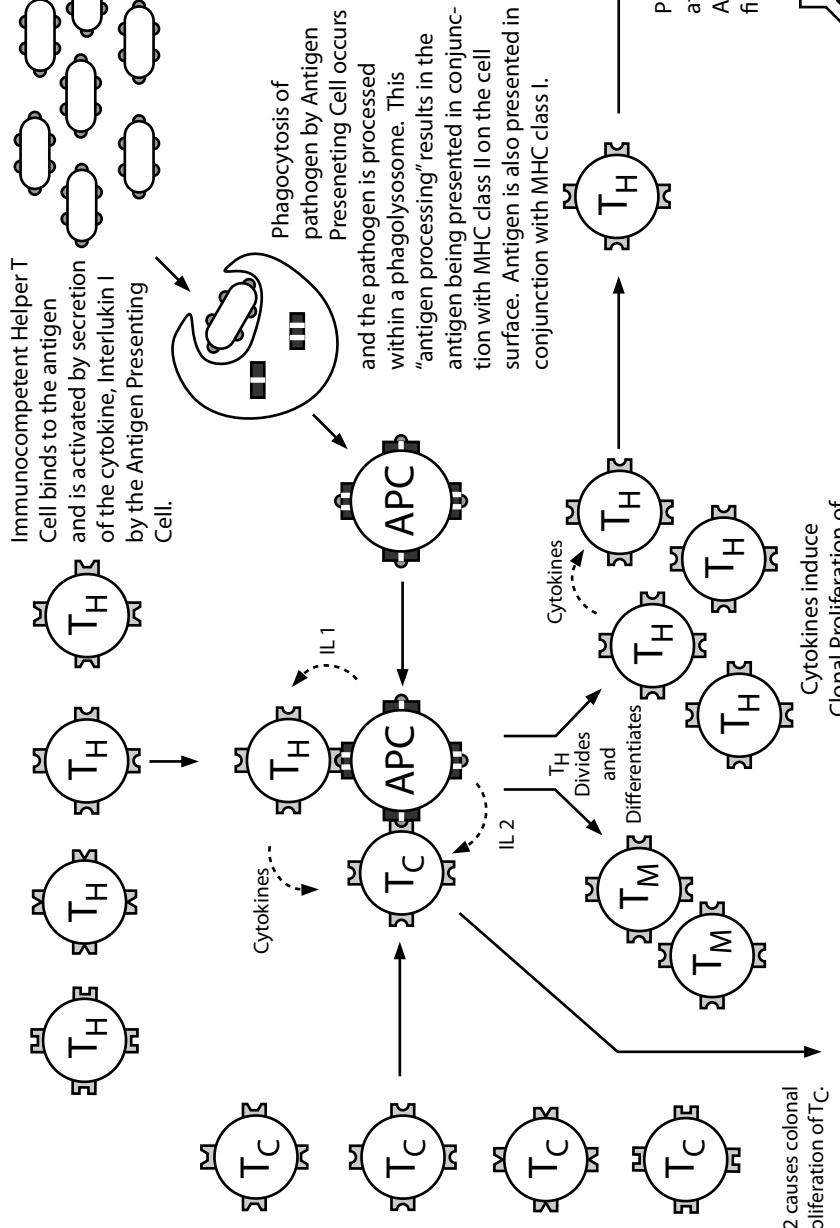
Cytotoxic T cells instruct infected body cells displaying antigen to lyse or APOPTOSE.

Cellular Immunity II

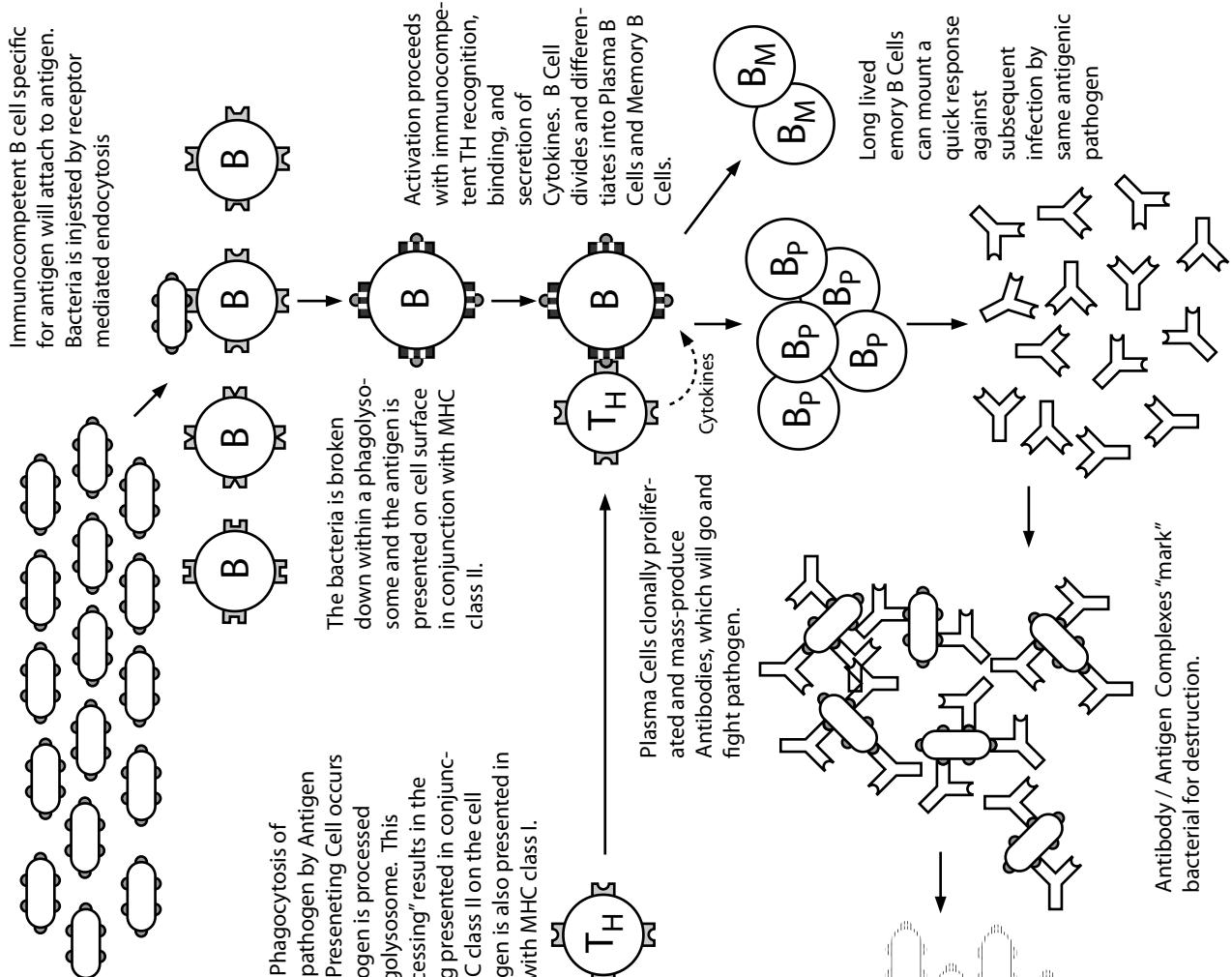


Interplay Between Cellular and Humeral Immune Responses (Against a Bacterial Infection)

Cellular Immunity



Humoral Immunity



Antibody / Antigen Complexes "mark" bacteria for destruction.