

B cells and viruses.

Immunology II, Gail A. Bishop, April 29, 2004

I. Antibodies. Two major functions in an antiviral response.

- 1) Neutralize viral determinants
- 2) Facilitating phagocytosis and destruction of free virus

A. *How they work.*

IgM and IgG target viruses present in blood and lymph, secondary lymphoid organs. IgA protects at mucosal surfaces, IgE triggers mast cells and basophils in the skin.

B. *Importance of affinity:* seem to need a threshold minimum affinity, usually between 10^8 and 10^{10} M^{-1} .

C. *Hypermutation of Ig genes.* Several mechanisms of action.

D. *Mechanisms of neutralization* include abrogation of viral attachment or fusion of viral and cell membranes, as well as stabilization of the viral capsid, preventing uncoating and viral entry.

II. Humoral memory to viruses.

A. *Two types of viral antigen:*

1. Highly organized, repetitive structure.
2. Soluble, less organized.

B. Two aspects of memory and their requirements.

1. *Maintenance of antibody titers.* Why is this important?
 - a. Even memory B cells take time to react, clonally expand, etc.
 - b. Only antibody, not B cells, can be passively transferred to fetus.
2. *Maintenance of memory B cells.*

III. What role does the B cell response play in successful vaccination?

Papers and general discussion.