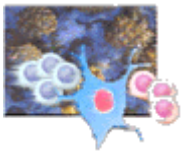
MECHANISMS OF IMMUNITY



MECHANISMS OF INNATE IMMUNITY

(1) **Physical and chemical barriers**:

– keratinization in the skin;

– mucus formation on the mucosal epithelium and ciliary clearance in the respiratory tract;

– production of various antimicrobial factors such as lysozyme, lactic and fatty acids, etc. in secretions;

– deactivation of dangerous microbes by digestive enzymes and peristalsis in the GI tract.

(2) **Microbial antagonism** to pathogenic microbes due to the body's own mutualistic and commensal microorganisms.

(3) **The liver** due to oxidation of xenobiotics, detoxification, and synthesis of many defense factors.

(4) **Cytotoxicity by complement.**

(5) **Phagocytosis** and **NETosis.**

(6) **"Acute phase" reaction** (C-reactive protein, serum amyloid A, mannose-binding lectin, etc).

(7) **Natural antibodies** produced by CD5+B cells.

(8) **Antimicrobial peptides** such as α defensins, cathelicidins, lactoferrin, dermicidin, etc.

(9) **Natural cytotoxicity** due to Innate Lymphoid Cells (ILCs) including NK cells, NKT cells and γōT cells plus **natural cytostasis** induced by interferons (IFNs).

FOUR TYPES OFADAPTIVE IMMUNE RESPONSES

B-CELL-MEDIATED (HUMORAL) RESPONSES:

(1) **Simple B-cell response** – formation of only one class of immunoglobulins, IgM, but no long-term memory. This type of response may be triggered by "patterns" too.

(2) **Advanced B-cell response** – switching antibodies after each other: IgM, IgG, IgA, and even IgE, and inducing the formation of long-lived memory plasma cells and lifelong memory B cells. *Type 2 helper T cells (plus type 1 helper T cells* in part) participate in the process.

T-CELL-MEDIATED RESPONSES:

(3) **Inflammatory CD4+T-cell response** that leads to the production of effector CD4+T cells and the lifelong memory CD4+T cells. *Type 1 helper T cells* participate in the response.

(4) **Cytotoxic CD8+T-cell response**, which results in the formation of cytotoxic CD8+T cells capable of apoptosis in target cells and lifelong memory CD8+T cells. *Type 1 helper T cells take part in the process*.