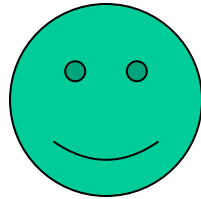


Immunity

pathogens



→ immune response*

bacteria (1 μ)

fungi (.1 - 1 μ)

virus (.01 - .1 μ)

1) cellular agents (10 μ)
(phagocytes, T & B cells)

2) chem. agents
(antimicrobial proteins)

3) processes
(inflammation,
a.a. complex actions)

***effective against micro-organism attacks**

Q: What about elephant attacks?

Immune Response Levels (1)

1st level: **innate defences**

- non-specific to pathogen type
- always available; born with it
- no "memory"
- more localized effects

2nd level: **acquired (adaptive) defences**

- specific to pathogen
- acquired as needed
- memory needed to recog. pathogen
& repeat immune response
- systemic; not just infection site

Immuno-competency

- 1) **definition: ability to recognize a specific antigen & bind to antigen-bearing object**
- 2) **incompetent cells: destroyed**
 - **T cells: only 2% survive**
 - **B cells: unknown**
- 3) **site: 1st stage: T cells (thymus)
B cells (bursa)**
 - **2nd stage: lymph nodes/organs**
- 4) **receptors on immunocompetent cells**
 - **numerous, 10, 000 - 100,000 per cell**
 - **structurally same on all cells,
yet each cell reacts only to one antigen**

Humoral Immunity

= antibody-mediated immunity

B cell development:

- 1) lymphocytes grow in bone marrow
- 2) B lymphocytes stay in bone marrow
- 3) B cells dev. immuno-competency in bone marrow
- 4) B cells mature in lymph nodes/organs
- 5) antibodies circulate in blood, lymph
- 6) bind to antigens on foreign cells*
- 7) directly or indirectly lyse these cells

***intact bacteria, bacterial toxins, RBC, free viruses**

Humoral Immunity Terms

- 1) B cell dev.
- 2) B cell - clonal selection
- 3) B cells - B lymphocytes, plasma cells,
memory B cells,
antigen-presenting cells
- 4) antigen
- 5) antibody
- 6) Ig review (A, D, E, G, M)
- 7) antigen-antibody complex
- 8) 1° & 2° humoral responses
- 9) immunological memory

B Cell Cloning

- 1) primary response**
- 2) cloning**
- 3) formation of plasma cell & memory B cell**
- 4) production of antibodies**
- 5) secondary response**
- 6) cloning of memory B cell**
- 7) repeat starting from step #3**

This review is not collected.

Blood Types

blood type	antigen RBC	antibody plasma	compatible transfusion
A	A	anti-B	A, limited O
B	B	anti-A	B
O	no A or B	anti-A & B	O only
AB	A & B	no anti-A or B	Ab, limited A, B, & O
Rh+	Rh	no anti-Rh	Rh+
Rh-	no RH	after 1st exp., anti-Rh	Rh-

Cellular Immunity

= cell-mediated immunity

T cell development:

- 1) lymphocytes grow in bone marrow
- 2) T lymphocytes migrate to thymus
- 3) T cells dev. immuno-competency in thymus
(only 2% survive)
- 4) T cells circulate in blood
- 5) macrophage phagocytize infected cells*
- 6) T cells activated by APC (macrophage)
in lymph, lymph nodes/organs
- 7) Killer T cells bind to & destroy foreign cells

***virus, parasite, cancer, grafts & transplants**

T Cell Cloning

- 1) primary response**
- 2) cloning of T cells (memory, killer, helper, suppressor)**
- 3) production of mature killer cells**
- 5) secondary response**
- 6) cloning of memory T cell**
- 7) repeat starting from step #2**

This review is not collected.

Hum. vs Cell. Immunity

Similarity:

- circulate blood & lymph,
- recognize, bind to, and destroy foreign bodies

Differences:

- 1) humoral immunity
 - antibodies from B cells mark foreign bodies for destruction
- 2) cellular immunity
 - living T cells directly or indirectly destroy foreign cells

Hypersensitivity (1)

hypersensitivity (allergy)

**= excessive & continued immune response
- miserable, not fatal**

3 levels:

1) immediate hypersensitivity

allergen: pollen, dust mites, trace chem.

reaction: immed., temp. discomfort, IgE

ex: anaphylaxis, atopy (hives, hay fever, asthma)

Hypersensitivity (2)

2) subacute hypersensitivity

allergen: RBC antigen, moldy hay, mushroom spores

reaction: slower & longer discomfort, IgG & IgM

ex: wrong transfusion, pulmonary disorders

3) delayed hypersensitivity

allergen: salmonella bact., poison ivy,

heavy metals (Hg, Pb)

reaction: delayed, large scale, contagious

**ex: cancer resistance, skin grafts, organ transplant
poison ivy**