

Immunology

1) What can weaken the immune system?

- Deficiencies in nutrition
- Decreased ability to metabolize nutrients
- Increase in stress

2) What cells are associated with the immune system?

- Leukocytes WBC
- Monocytes
- Neutrophils
- Basophils
- Eosinophils
- Lymphocytes (B cells, T cells, NK cells)

3) How does the major histocompatibility complex work?

All cells in the body are tagged. Self-markers label body's cells as "good" [MHC I]. "Bad" cells have MHC2 presenting antigen fragments to the body's adaptive immune system.

4) What are the types of immunity?

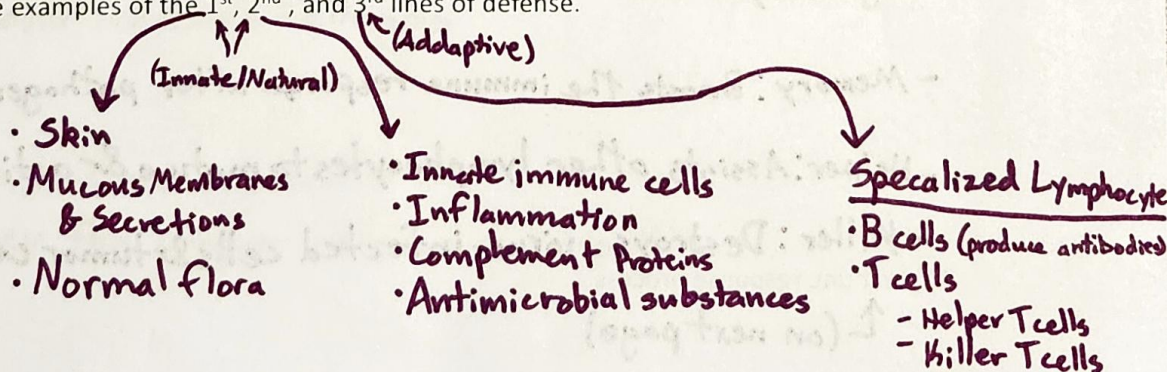
Innate (faster, generic)

- Immediate: Localized response
- Induced: Recruitment of more cells (cytokines)

Adaptive (Slower & more specific, systemic whole body response)

- Humoral: B cells produce antibodies [specific]
↳ deals with freely circulating pathogens
- Cell mediated: T cells destroy infected cells

5) Give examples of the 1st, 2nd, and 3rd lines of defense.



6) Explain why there are "good" bacteria. Where are they found?

→ In the gut

The bacteria in the gut helps with breaking down food into nutrients.

7) What are the four signs of inflammation? (Bonus: What are their Latin names?)

1) Redness
(Rumor)

2) Pain
(Dolor)

3) Heat
(Calor)

4) Swelling
(Tumor)

8) Explain how antibodies work.

• Neutralization: bind to antigens. They can't bind to body cells

• Agglutination: causes antigens to clump up

• Goal of antibodies is to mark antigens for removal

9) True or False: Effector cells do NOT directly fight infections

10) What do memory cells and effector cells do after B cell activation and proliferation of mature B cells occurs?

Memory & Effector Cells are B-Cells

• Memory cells store antigen information

• Effector cells release antibodies to fight the antigen

11) What are the different types of T cells and how do they assist in an immune response?

- Naïve: Hasn't encountered the antigen

- Regulatory: Modulates the immune system

- Memory: Boosts the immune response after pathogen reintroduction

- Helper: Assists other lymphocytes to mature & activate

- Killer: Destroys virus-infected cells & tumor cells

12) Immune response process

↑ (on next page)

Antigen enters the body. A cell recognizes it shouldn't be there due to lack of MHC I. Mast cells secrete histamine (vaso dilator) which causes an increase in temperature which sometimes kills off pathogens. If that didn't work, phagocytes will try to clean up the antigens.

If that fails, then the adaptive immune system takes over. After the infection & proliferation of infected cells (above) has happened, a memory T-cell will recognize the infected qualities (nodules) this causes cytokines to be released. Cytokines cause the adaptive immune system to activate other T-cells. Killer-T cells replicate and then induce apoptosis (NOT lysis) in the infected cells. Phagocytes will then clean up the pieces of destructed cells.

↳ B-cells release antibodies to help fight the antigen.

At the very end, regulator T-cells turn off the Helper-T Cells & B-cells

13) What is the hygiene hypothesis? What cells work with the allergy responses in the body?

↓
We are too clean

↳ Innate immune response isn't activated enough so it is weaker

↑ over reactions = allergies

↳

- Mast Cells
- Eosinophils
- Basophils
- B-cells

14) Why is homeostasis so important?

key for proper immune function