

## Worksheet for Assessment of Immune Functions

**1. Describe the 3 functions of the immune system.**

- Defense: the body protects against invasions by microorganisms and prevents the development of infection by attacking foreign antigens and pathogens.
- Homeostasis: damaged parts on cells are digested and removed. The body's different cell types stay uniform and unchanged.
- Surveillance: mutations continually arise but are recognized as foreign cells and destroyed.

**2. What is an antigen? What does it do?**

Antigens are substances the body recognizes as foreign that elicit an immune response.

**3. What are antibodies? What do they do?**

Immune globulins produced by lymphocytes in response to antigens; antibodies attach to antigens and attract cells to destroy the pathogen.

**4. Describe the 3 lines of defense. Give an example for each line of defense**

- First line of defense: Physical, biochemical, or mechanical barriers that offer surface protection to prevent the invasion of microbes. An example is the skin.
- Second line of defense: the inflammatory response, which relies on the actions of interferon complements and phagocytosis that engulfs and destroys microorganisms or pathogens. An example is immune cells like neutrophils and eosinophils.
- Third line of defense: acquired, or adaptive immunity, which occurs by natural or artificial exposure to an infection, antigen, or vaccine. This type of immunity protects by way of cellular mediated and humoral mediated mechanisms that provide specific antigen-antibody reactions. It provides cytokine regulation and B and T lymphocyte activation. An example is lymphocytes (B and T cells).

**5. Describe innate immune system**

It is present at birth and involves a nonspecific response; neutrophils and monocytes are the primary white blood cells involved.

**6. What is the difference between active and passive immunity?**

Active has long-lasting immunity where the body makes its own antigens whereas passive has short-term immunity and they don't make their own antigens.

**7. What are T-cells and their function?**

They are lymphocytes that differentiate into plasma cells when activated and make antibodies to recognize foreign substances.

**8. What are B-cells and their function?**

They are lymphocytes that provide immunity to intracellular viruses, tumor cells, and fungi and are responsible for long-term immunity.

**9. What is the difference between natural and artificial immunity?**

Natural is not produced by an immune response whereas active is gained after birth as a result of the immune response.

**10. What is the difference between active and passive immunity?**

Active has long-lasting immunity where the body makes its own antigens whereas passive has short-term immunity and they don't make their own antigens.

**11. Give examples of the types immunity described in questions 9 & 10.**

Natural immunity: actual contact with chicken pox infection

Artificial immunity: injection of snake antivenom antibodies from one person into another person

Active immunity: chicken pox vaccine

Passive immunity: gamma globulin injections

**12. What is immunosenescence?**

This is the gradual deterioration of the immune system brought on by the natural aging process. It involves both the person's capability of responding to infections, and the development of long term immune memory, especially by vaccination.

**13. Describe 3 age-related changes to the immune system in the older adult.**

-There is a failure to recognize abnormal cells (which then makes it a higher incidence of cancer developing).

-There is a decrease in the ability of antibodies to distinguish self from non-self (so there is an increased incidence of autoimmune diseases as we age).

-There is decreased cell mediated immunity and decreased humoral immunity which results in lower antibody results when given a vaccination.

**14. How does nutrition impact immune function?**

Malnutrition can increase the risk of infections and infections are more likely to have more serious consequences among people with malnutrition because antibody production is decreased, the capacity of phagocytes to kill bacteria is decreased, etc.