Immune System | Topic Notes

Pathogens are any organisms that cause disease.

General defence system:

Barrier:	Non-specific cellular response:
Skin-prevents the entry of pathogens	**Phagocytes, macrophages**- phagocytosis
Sebaceous glands-produce sebum (oily substance that prevents skin cracking)	**The following chemicals** cause inflammation & attract white blood cells:
Mucous-traps pathogens	○ **Histamine**-released by infected cells
Cilia-sweep away particles from the lungs	○ **Complement**-help to kill pathogens
Ear wax-traps pathogens	○ **Interferons**-interfere with viral replication and attract white blood cells
Tears-wash away small pathogens	**Fever**-denatures enzymes and proteins in bacteria and enzymes
Stomach acid-kills most bacteria	**Lysozyme**-bacteria killing enzyme in tears and saliva (breaks open their cell walls)
Blood clotting-prevents entry of bacteria	

- **Antigens** are surface proteins that cause the production of antibodies.
- **Antibodies** are proteins produced by lymphocytes in response to the presence of antigens.
- **Induced immunity** is the stimulation of monocytes and lymphocytes to get rid of a specific antigen present in the body.
- **Active immunity** is the production of antibodies by lymphocytes in response to a specific antigen.
    1. **Natural active immunity** occurs when lymphocytes produce antibodies in response to the body becoming infected with a pathogen from the environment.
    2. **Artificial active immunity** occurs when lymphocytes produce antibodies in response to the pathogen being administered through vaccination.
- **Vaccination** is the administration, usually by injection, of a non-disease-causing dose of a pathogen or part of a pathogen (such as its antigen/toxin) which causes active immunity.
- **Passive immunity** is the transfer of antibodies from one organism to another.

1. **Natural passive immunity** is when a baby receives antibodies directly from its mother either through the placenta before birth or via breast milk.
2. **Artificial passive immunity** is when a person receives an injection of antibodies made in another organism.

- **Immunisation** is the protection against pathogens, or the toxins of these pathogens, by vaccination or injection of antibodies.