

LC Biology – Key Definitions

Pathogens



A foreign body or cell that causes disease. Pathogens include bacteria, virus and fungi. Humans defend themselves against them using two defence systems: the general defence system and the specific defence system.

General defence system



Tries to defend us against all pathogens. It acts by preventing the entry of pathogens into the body or by destroying them when they do enter.

The specific defence system



Or the immune system, acts against one type of pathogen or antigen.

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Antigens and antibodies

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An antigen is a foreign substance that stimulates the production of antibodies. An antibody is a protein produced by white blood cells in response to an antigen.

Induced immunity

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Is the ability to produce antibodies against specific antigens. It can be active or passive.

Active induced immunity

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Means that the body produces its own antibodies. This gives long-term immunity because memory cells survive in the body. There are two types of active induced immunity: natural and artificial.

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Vaccine

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A non-reproductive dose of an antigen designed to stimulate antibodies. It is a type of artificial active induced immunity.

Passive induced immunity

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Happens when antibodies pass from one organism to another (usually from a mother to a baby). This gives short-term immunity as the antibodies last only about 6 months and no memory cells are produced. Passive induced immunity can be natural or artificial.

Composition of blood

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Blood is composed of four parts: plasma, red blood cells, white blood cells and platelets.

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Plasma



- Liquid part of blood, pale yellow and makes up about 55% of blood.
- Composed of 90% water, 7% protein and 3% dissolved materials.
- The main proteins in plasma are antibodies and clotting proteins.

Red blood cells



- Made in the bone marrow of long bones such as ribs, breastbones, arms or legs.
 - Transport oxygen.
- Cannot repair themselves, live for about 4 months
- Dead red blood cells are broken down in the spleen and liver.

White blood cells



- Colourless and are about twice the size of red cells but have no definite shape.
- Have a nucleolus and mitochondria.
 - They live for a few days and can reproduce themselves.
- Are less numerous than red cells (1:700).

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Platelets

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- Made in the bone marrow.
- A large cell called a megacyte is formed and split into fragments. These fragments are platelets.
- They have no nuclei and are not cells.

The function of blood – transport

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- Food, salts, carbon dioxide, urea and hormones in plasma.
- Oxygen in red blood cells.
- Heat in plasma.

The function of blood – fight infection

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- White blood cells surround and destroy pathogens.
 - White blood cells make antibodies which destroy pathogens.
 - Platelets clot blood, which prevents the entry of pathogens.