

Chapter 6: Preventing and treating disease

Knowledge organiser

Non-specific defences

Non-specific defences of the human body against all pathogens include the skin, nose, and stomach. Give examples of how these can prevent disease.

Skin

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Nose

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Stomach

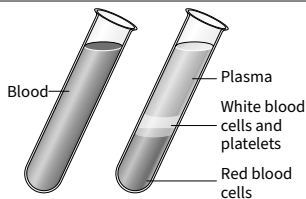
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White blood cells

If a pathogen enters the body, the _____ system tries to destroy the pathogen.

The function of **white blood cells** is to fight _____.

There are two main types of white blood cell – _____ and _____.



Lymphocytes

Lymphocytes fight pathogens in two ways:

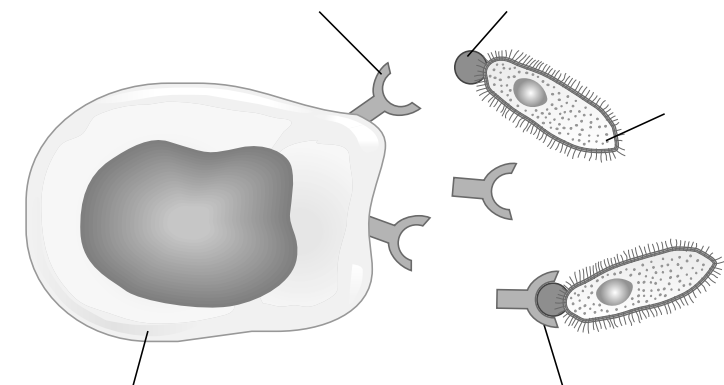
Antitoxins

Lymphocytes produce **antitoxins** that bind to the _____ produced by some pathogens (usually bacteria). This _____ the toxins.

Antibodies

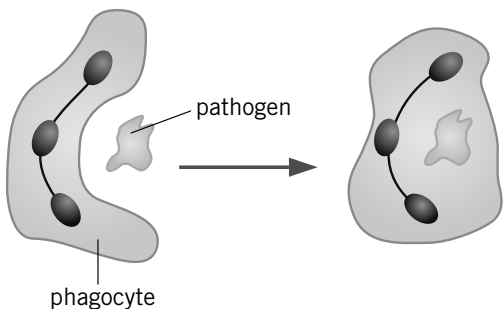
Lymphocytes produce **antibodies** that target and help to destroy specific _____ by binding to _____ (proteins) on the pathogens' surfaces.

Label the diagram.



Phagocytes

- 1 Phagocytes are attracted to areas of _____.
- 2 The phagocyte surrounds the pathogen and _____ it.
- 3 _____ that digest and destroy the pathogen are released.



Monoclonal antibodies (HT only)

Monoclonal antibodies are produced by mouse lymphocytes which are combined with a tumour cell to make a _____. These can divide to make an _____ which can later be cloned and used to treat diseases such as _____ or used in pregnancy tests.

Treating diseases

Antibiotics

- **Antibiotics** are medicines that can kill _____ in the body.
- Specific bacteria need to be treated by specific _____.
- Antibiotics have greatly _____ deaths from infectious bacterial diseases, but _____ - _____ strains of bacteria are emerging.

Treating viral diseases

- Antibiotics do not affect _____.
- Drugs that kill viruses often damage the body's _____.
- _____ treat the symptoms of viral diseases but do not kill pathogens.

Discovering and developing new drugs

Drugs were traditionally extracted from _____ and _____, for example

- the heart drug digitalis comes from foxglove plants
- the painkiller _____ originates from willow trees
- _____ was discovered by Alexander Fleming from *Penicillium* mould.

Most modern drugs are now synthesised by chemists in _____.

New drugs are extensively tested and trialled for

- _____ – is it harmful?
- _____ – does it work?
- _____ – what amount is safe and effective to give?

Stages of clinical trials

_____ trials

Drug is tested in cells, tissues, and live animals.

Clinical trials

- 1 _____ volunteers receive very low doses to test whether the drug is _____ and _____.
- 2 If safe, larger numbers of healthy volunteers and patients receive the drug to find the _____ dose.

_____ review

Before being published, the results of clinical trials will be tested and checked by independent researchers. This is called _____ **review**.

Double-blind trials

Some clinical trials give some of their patients a _____ drug – one that is known to have no effect.

Double-blind trials are _____. This reduces _____ in the trial.

Vaccinations

Vaccinations involve injecting small quantities of _____ or _____ forms of a pathogen into the body. This stimulates _____ to produce the correct antibodies for that pathogen. If the same pathogen re-enters the body, the correct _____ can be produced quickly to prevent _____. If a large proportion of the population is vaccinated against a disease, it is less likely to spread. This is called _____.



Key terms

Make sure you can write a definition for these key terms.

antibiotic antibody antigen antitoxin dose double-blind trial efficacy Herd immunity
monoclonal antibodies mucus peer review placebo toxicity vaccination white blood cell

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Retrieval questions

Answer the following questions using the information from the knowledge organiser.

B6 questions		Answers
1	What non-specific systems does the body use to prevent pathogens getting into it?	.
2	What three functions do white blood cells have?	.
3	What happens during phagocytosis?	.
4	What are antigens?	
5	Why are antibodies a specific defence?	
6	What is the function of an antitoxin?	
7	What does a vaccine contain?	
8	How does vaccination protect against a specific pathogen?	
9	What is herd immunity?	
10	What is an antibiotic?	
11	What do painkillers do?	
12	What properties of new drugs are clinical trials designed to test?	
13	What happens in the pre-clinical stage of a drug trial?	
14	What is a placebo?	
15	What is a double-blind trial?	
16	What is a monoclonal antibody?	
17	Give two examples in which monoclonal antibodies can be used for.	