

14 Which statements are correct descriptions of methods of preventing pathogens from entering the body?

- 1 Fibrin is converted to fibrinogen to form a mesh.
- 2 Phagocytes produce antibodies.
- 3 Platelets clot blood.
- 4 Lymphocytes engulf pathogens.

A 1, 3 and 4 B 1 and 3 only C 2 and 4 D 3 only

16 Three statements about immunity are listed.

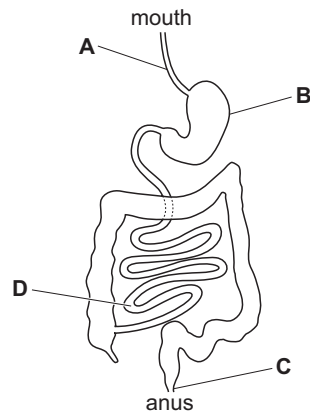
- 1 Specific antibodies are produced in response to specific antigens.
- 2 Pathogens have specific antigens.
- 3 A vaccination stimulates an immune response.

Which statements are correct?

A 1, 2 and 3 B 1 and 3 only C 1 only D 2 and 3 only

15 The diagram shows the human digestive system.

Where do cholera bacteria cause the secretion of chloride ions?



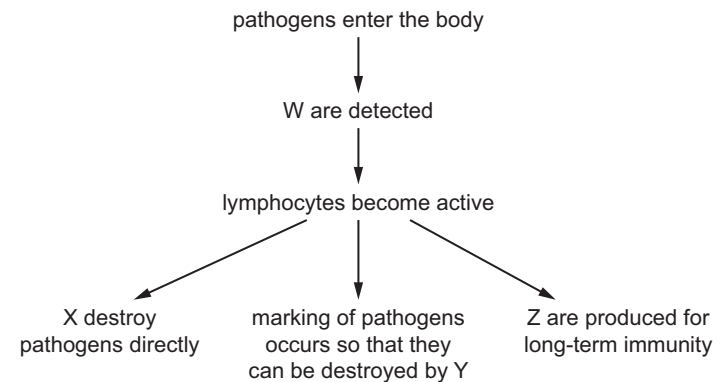
22 Which action would help to limit the development of antibiotic resistance in bacteria?

- A Use antibiotics frequently to prevent infection by antibiotic-resistant bacteria.
- B Use antibiotics only to treat bacterial infections.
- C Use antibiotics to treat all types of infections.
- D Use antibiotics to treat only viral infections.

17 What is an example of active immunity?

- A antibody production after infection
- B antibody transfer from mother to baby in breast milk
- C antibody transfer from mother to fetus across the placenta
- D an injection of antibodies that were produced by another individual

16 The diagram shows what happens in the body during active immunity.



Which structures or cells represent W, X, Y and Z?

	antibodies	antigens	memory cells	phagocytes
A	W	X	Y	Z
B	W	X	Z	Y
C	X	W	Y	Z
D	X	W	Z	Y

17 Cholera is a disease caused by a bacterium called *Vibrio cholerae* which produces a toxin in the infected person's gut.

What is the effect of this toxin?

- A The toxin causes loss of water from the gut into the blood.
- B The toxin causes loss of water from the gall bladder into the blood.
- C The toxin causes water to enter the gut from the blood.
- D The toxin causes water to enter the gall bladder from the blood.

19 Three statements about immunity are listed.

- 1 The transfer of antibodies from mother to baby in breast milk is an example of passive immunity.
- 2 Passive immunity results in long-term immunity because of the production of memory cells.
- 3 Active immunity is gained after vaccination with antigens.

Which statements are correct?

- A 1, 2 and 3 B 1 and 2 only C 1 and 3 only D 2 and 3 only

5 Penicillin is an antibiotic.

- (a) (i) State the type of organism that antibiotics are used to kill.

..... [1]

- (ii) It is important to try and limit the development of antibiotic resistance.

Describe ways of limiting the development of antibiotic resistance.

.....

 [2]

- (b) Penicillin is produced by an organism called *Penicillium chrysogenum*.

Fig. 5.1 is a diagram of *Penicillium chrysogenum*.

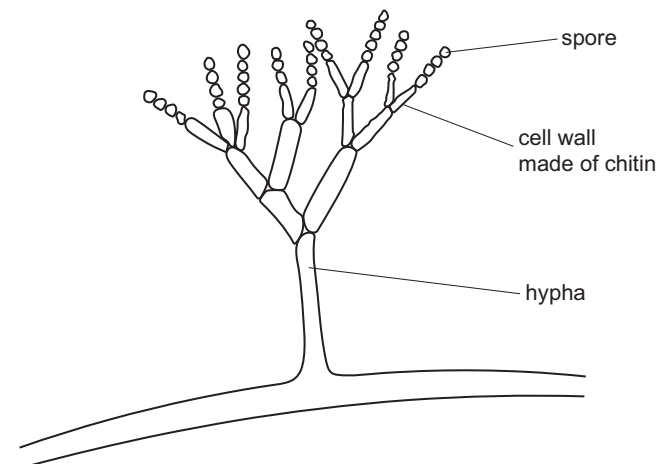


Fig. 5.1

- (i) State what *Penicillium* in the scientific name of *Penicillium chrysogenum* represents in the binomial system.

..... [1]

- (ii) Using the information in Fig. 5.1, identify the kingdom that contains *Penicillium chrysogenum*.

..... [1]

(c) Penicillin can be made in a fermenter.

(i) State the name of **one other** product made in a fermenter.

..... [1]

Fig. 5.2 shows a fermenter.

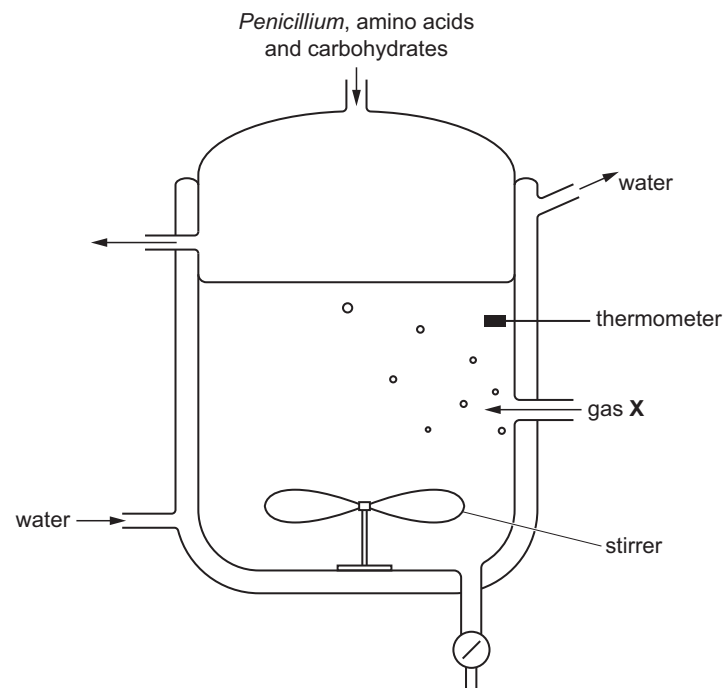


Fig. 5.2

(ii) Gas X in Fig. 5.2 is needed for the production of penicillin.

State the name of gas X.

..... [1]

(iii) The concentration of gas X is one of the conditions that must be controlled to ensure that penicillin is produced.

State the **other** conditions required to produce penicillin **and** describe how they are controlled in the fermenter.

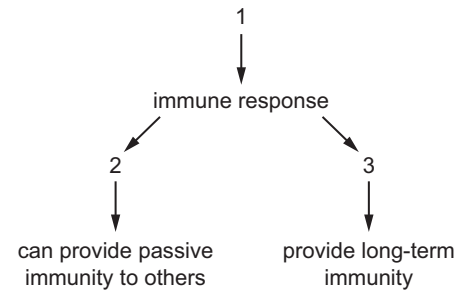
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..... [5]

(d) State the name of the organism that is used in bread-making **and** in biofuel production.

..... [1]

[Total: 13]

- 17 The diagram shows the effect of vaccination on the human body. Three components in the diagram are represented by numbers.



Which components are memory cells?

- A** 1 only **B** 2 and 3 **C** 2 only **D** 3 only