Diseases and immunity – 2021 IGCSE 0610

1. Nov/2021/Paper_11/No.21

Some features that help to defend the body against pathogens are listed.

1 mucus

2 skin

3 stomach acid

4 phagocytosis

Which features can prevent pathogens entering body tissues?

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2 and 3 only

D 4 only

2. Nov/2021/Paper_12/No.21

Some features that help to defend the body against pathogens are listed.

1 mucus

2 skin

3 stomach acid

4 phagocytosis

Which features can prevent pathogens entering body tissues?

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2 and 3 only

D 4 only

3. Nov/2021/Paper_12/No.29

Which substance can be used to treat a bacterial infection?

A adrenaline

B antibiotics

C antigens

D insulin

4. Nov/2021/Paper_12/No.32

HIV is a sexually transmitted infection (STI).

Which methods could be used to reduce the spread of HIV?

1 breast-feed babies

2 education about how HIV is spread

3 provide easy access to condoms

4 provide needle exchange schemes for drug users

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

5. Nov/2021/Paper_13/No.21

Some features that help to defend the body against pathogens are listed.

1 mucus

2 skin

3 stomach acid

4 phagocytosis

Which features can prevent pathogens entering body tissues?

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2 and 3 only

D 4 only

6. Nov/2021/Paper_22/No.21

Some features that help to defend the body against pathogens are listed.

1 mucus

2 skin

3 stomach acid

4 phagocytosis

Which features can prevent pathogens entering body tissues?

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2 and 3 only

D 4 only

7. Nov/2021/Paper_22/No.30

Which statement about the human immunodeficiency virus (HIV) is correct?

A Antibodies cannot be made.

B HIV infections can be treated with antibiotics.

C HIV destroys lymphocytes.

D HIV is spread by coughing and sneezing.

8. Nov/2021/Paper_23/No.21

Some features that help to defend the body against pathogens are listed.

1 mucus

2 skin

3 stomach acid

4 phagocytosis

Which features can prevent pathogens entering body tissues?

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2 and 3 only

D 4 only

9. Nov/2021/Paper_23/No.27

How can the development of antibiotic resistance in bacteria be reduced?

A treating every disease with antibiotics

B treating infections caused by a virus with antibiotics

C using antibiotics only when essential

D using antibiotics regularly to prevent disease

10. Nov/2021/Paper_23/No.30

What are likely consequences of HIV infection?

1 decreased lymphocyte numbers

2 reduced active immunity

3 reduced passive immunity

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

11. Nov/2021/Paper_33/No.2

Transmissible diseases are caused by pathogens.

(a) Cholera is a transmissible disease that causes diarrhoea.

State the type of organism that causes cholera.

..... [1]

(b) One method of controlling the spread of disease is to treat raw sewage to make it safe.

(i) Describe how raw sewage is treated to make the water safe to drink and safe to release into the sea.

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..... [3]

(ii) State **one** other method of controlling the spread of disease.

..... [1]

(c) The body has defences against diseases.

(i) The body has barriers that prevent pathogens from entering the body.

State the name of **one** mechanical barrier and **one** chemical barrier.

mechanical .....

chemical .....

[2]

(ii) State **one** product of white blood cells that defends the body from pathogens.

..... [1]

[Total: 8]

12. Nov/2021/Paper_33/No.8

(a) **(i)** State the type of pathogen that can be treated with antibiotics.

..... [1]

(ii) State the **name** of the pathogen that can lead to AIDS.

..... [1]

(b) Many pathogens have developed resistance to some antibiotics. A study took samples of pathogens and tested them for resistance to various types of antibiotics. Fig. 8.1 shows the percentage of pathogens sampled that were resistant to various antibiotics. The samples were taken between 2000 and 2013.

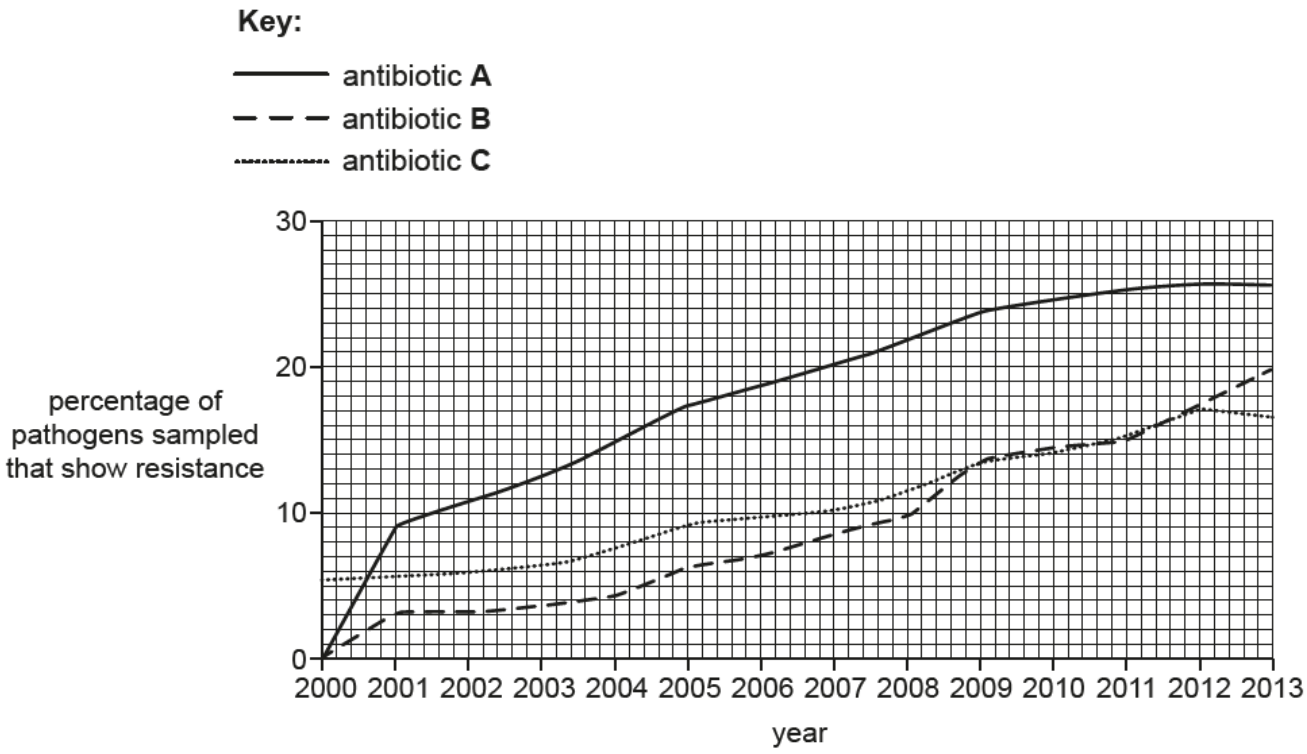

Fig. 8.1

(i) State the meaning of antibiotic resistance.

..... [1]

(ii) Describe the pattern of resistance for the three antibiotics shown in Fig. 8.1.

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..... [3]

(c) Some medicinal drugs, such as human insulin, can be made using biotechnology and genetic engineering.

(i) State where insulin is produced in humans.

..... [1]

(ii) State the function of insulin in humans.

..... [1]

(d) **(i)** State why bacteria are useful in biotechnology.

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..... [2]

(ii) Describe the role of yeast in biotechnology.

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..... [3]

[Total: 13]

13. Nov/2021/Paper_41/No.4

Cholera is a transmissible disease.

(a) State the name of the type of pathogen that causes cholera.

..... [1]

(b) A study was designed to test the effectiveness of a cholera vaccine in an area where outbreaks of cholera occur frequently.

The doctors gave some people in this area the new vaccine.

(i) Suggest what the cholera vaccine must contain to be effective.

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..... [1]

(ii) Explain why the people were not protected from cholera immediately after receiving the vaccine.

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..... [3]

(iii) The doctors ensured that the people who received the new vaccine had **not** had cholera before.

Suggest why.

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..... [1]

(c) The researchers analysed two pigments, chlorophyll and lycopene, in homozygous red tomato fruit and homozygous yellow tomato fruit. Chlorophyll is found in unripe tomato fruit.

(i) Describe the function of chlorophyll.

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..... [2]

(ii) State the name of **one** mineral required for the synthesis of chlorophyll.

..... [1]

(iii) The researchers analysed the concentration of the pigments in tomato fruits:

- before they were ready to eat (unripe)
- when they were ready to eat (ripe).

The results of the analysis are shown in Table 2.1.

Table 2.1

	chlorophyll concentration / mg per g of tomato fruit	lycopene concentration / mg per g of tomato fruit
unripe red fruit	10.0	0.0
ripe red fruit	1.2	105.7
unripe yellow fruit	6.2	0.0
ripe yellow fruit	0.4	0.7

Use the information in Table 2.1 to compare the changes in pigments in red fruit and yellow fruit as they ripen.

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..... [3]

(d) A gene is responsible for the production of lycopene in fruits. Geneticists have recently produced genetically modified pink pineapples using the gene associated with the production of lycopene.

(i) Genes are found at specific locations on an important biological molecule.

State the name of this biological molecule.

..... [1]

(ii) Describe the disadvantages of genetically modifying crops.

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..... [2]

[Total: 16]

14. Nov/2021/Paper_43/No.4

HIV is a pathogen that can cause AIDS.

(a) Describe how HIV is transmitted from one person to another.

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..... [3]

(b) All viruses contain genetic material. HIV contains genetic material called RNA.

State **one** other feature common to all viruses.

..... [1]

(c) **(i)** Describe the function of lymphocytes.

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..... [3]

(ii) State how infection with HIV affects the lymphocytes if untreated.

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..... [1]

(d) Doctors wanted to determine whether dietary supplements could help people infected with HIV.

They randomly put volunteers with HIV into two groups:

- a treatment group, who received HIV medication and additional vitamin and mineral supplements
- a control group, who received HIV medication but no additional supplements.

The details of the two groups are outlined in Table 4.1.

Table 4.1

	treatment group	control group
total number of volunteers	18	22
average age / years	45.6	46.6
average mass / kg	82.3	82.5

The dietary supplements were given to the treatment group twice a day for three months. The nutrients in the supplements included:

- vitamin C
- vitamin D
- calcium
- iron
- other minerals and vitamins.

(i) Explain why vitamin C and iron are important in the human diet.

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..... [4]

Table 4.2 shows some of the results from the study.

Table 4.2

	treatment group		control group	
	at the start	after three months	at the start	after three months
average number of lymphocytes / cells per µg of blood	357	422	461	461
average number of copies of HIV RNA per cm^3 of blood	4291	897	2648	5935

(ii) Use the data for the treatment group, shown in Table 4.2, to calculate the percentage decrease in the average number of copies of HIV RNA per cm^3 of blood.

Space for working.

.....%
[2]

(iii) Evaluate the effect of the dietary supplements on the lymphocytes.

Use the information in Table 4.2 in your answer.

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..... [2]

[Total: 16]