

Drugs

IGCSE Biology ■ Topic 15

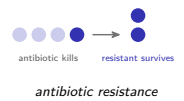
IGCSE Biology



Drugs

What we will cover

- 1 What a drug is
- 2 Antibiotics
- 3 Testing antibiotics
- 4 Antibiotic resistance



1 Drugs and antibiotics

Drugs

└ Drugs and antibiotics

What a drug is



A **drug** 药物 is any substance taken into the body that changes or affects the **chemical reactions** 化学反应 in the body.

Many drugs are medicines that help to treat illness.

Drugs
└ Drugs and antibiotics

Antibiotics

Antibiotics 抗生素 treat **bacterial** 细菌 infections.

They kill **bacteria** but have **no** effect on **viruses** 病毒 – so they cannot cure a cold or flu.

 **bacterium killed**

antibiotic bacterium

 **virus not affected**

antibiotic virus

Drugs

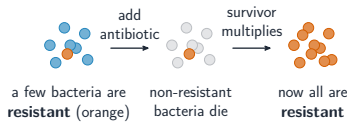
└ Drugs and antibiotics

Testing antibiotics



Paper discs of different **antibiotics** 抗生素 sit on a lawn of **bacteria** 细菌. A **clear ring** of no growth shows the **antibiotic** 抗生素 works; a **bigger** ring means it is more effective.

Antibiotic resistance



Resistant 耐药 bacteria survive & multiply, so the antibiotic stops working.

Use antibiotics **only when needed** & finish the course, or resistant strains like **MRSA** 耐甲氧西林金黄色葡萄球菌 spread.

Worked example – why the whole course matters

A patient stops taking their antibiotic as soon as they feel better, and the infection comes back. Explain.

- feeling better means **most** bacteria are dead, not all
- the survivors are the **least susceptible** ones
- with the antibiotic gone they multiply, and the population is now dominated by resistant bacteria
- so the same antibiotic works less well the second time

This is natural selection inside one patient. Finishing the course removes the survivors **before** they can reproduce – which is why the instruction exists.

Exam tips

- A drug is **any** substance that changes the body's chemical reactions – not only illegal drugs.
- Antibiotics kill **bacteria** only; they do **not** work on **viruses** (so they are useless against colds and flu).
- Overusing antibiotics leads to **resistant** bacteria like MRSA. Use them only when needed, and finish the whole course.

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Recap

Worked example – antibiotic resistance

Explain how a population of bacteria becomes resistant to an antibiotic.

- Random **mutation** makes a few bacteria resistant – this happens **before** the antibiotic is used.
- The antibiotic kills the non-resistant bacteria; the resistant ones **survive**.
- They reproduce, passing the resistance gene on.
- Soon **most of the population is resistant** – natural selection.

The antibiotic **selects**, it does not **cause** – the mutation came first, by chance. Antibiotics do nothing to **viruses**, so taking them for a cold only speeds this up.

Topic 15 – key takeaways

1 Drug

any substance that changes body reactions

2 Antibiotics

kill bacteria, not viruses

3 Testing

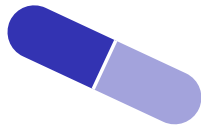
clear ring = the antibiotic works

4 Resistance

use only when needed; finish the course

Check yourself

- 1 What does a drug do to the body?
- 2 Do antibiotics work on viruses?
- 3 What shows an antibiotic worked on a plate?
- 4 How can we slow antibiotic resistance?



Answers 1. changes its chemical reactions 2. no, only bacteria 3. a clear ring of no growth 4. use only when needed; finish the course