

10 Infectious disease — Part 2

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)		
bacteria	细菌	_____	_____	_____
antibiotics	抗生素	_____	_____	_____
antibiotic	抗生素	_____	_____	_____
penicillin	青霉素	_____	_____	_____
cell walls	细胞壁	_____	_____	_____
viruses	病毒	_____	_____	_____
mutation	突变	_____	_____	_____
resistant	耐药	_____	_____	_____
natural selection	自然选择	_____	_____	_____

Recall

From Part 1 you know **bacteria** 细菌 cause diseases like cholera and TB. Here we look at the drugs that fight bacteria — and why they are losing their power.

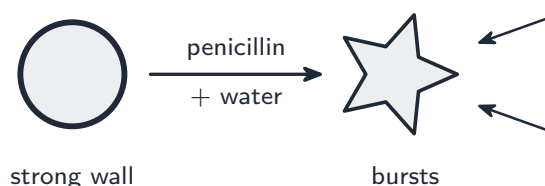
- You met **antibiotics** 抗生素 at IGCSE as medicines that treat bacterial infections.
- They do **not** work against viruses — this part explains why.

New ideas

Read these first, then do the Practice.

■ 1 How antibiotics work

An **antibiotic** 抗生素 is a drug that kills bacteria or stops them growing. For example, **penicillin** 青霉素 stops bacteria from building their **cell walls** 细胞壁. As the bacterium grows, its weak wall cannot hold it, so the cell takes in water and **bursts**.



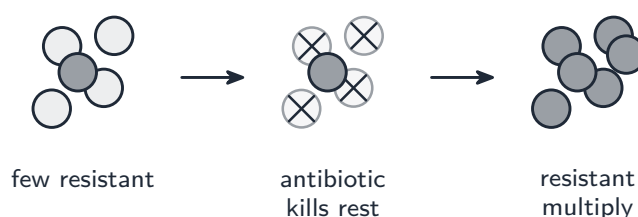
■ 2 Why not viruses?

Antibiotics do **not** work against **viruses** 病毒. A virus has no cell wall and no chemical reactions of its own — it just uses the host cell's machinery. So there is **no antibiotic target** in a virus. (This is why antibiotics do not treat a cold.)

■ 3 Antibiotic resistance

Sometimes a **mutation** 突变 makes a bacterium **resistant** 耐药 — the antibiotic no longer kills it. Resistance spreads by **natural selection** 自然选择:

- when the antibiotic is used, the non-resistant bacteria die, but the resistant ones survive.
- the survivors multiply, so over time more and more bacteria are resistant.



To slow resistance: only use antibiotics when needed, always **finish the full course**, and reduce their heavy use in farming.

Watch out: antibiotics kill *bacteria* (e.g. by stopping cell-wall building) but do *nothing* to viruses (no cell wall, no reactions of their own to target). Resistance spreads by *natural selection*.

Practice

Try these in order.

10.1 What is an antibiotic? [1]

10.2 Explain how penicillin causes a growing bacterium to burst. [2]

10.3 Give one reason why antibiotics do not work against viruses. [1]

10.4 A few bacteria in a population are resistant to an antibiotic. Explain how, over time, most of the population can become resistant. [3]

10.5 State two things people can do to slow down antibiotic resistance. [2]

10.6 Challenge. Stopping a course of antibiotics early can make resistance worse. Explain why, using natural selection. [2]
