

Exercise walk-through

Biotechnology and genetic modification ■ 21.1

eXercise

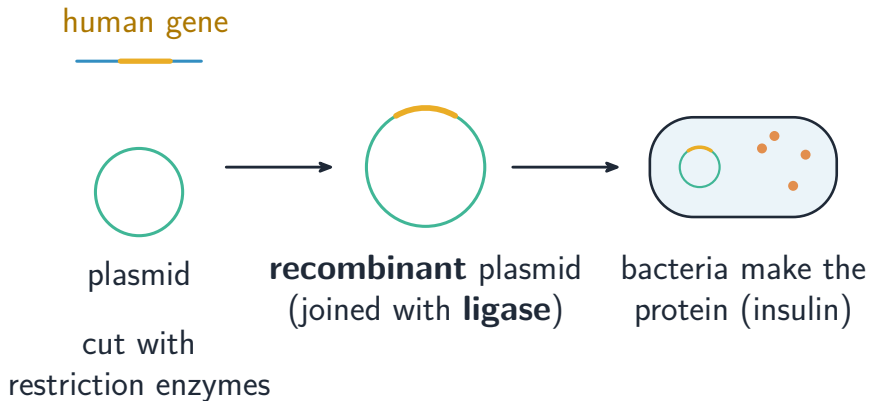
You must be able to

- define biotechnology and genetic modification
- explain why bacteria are used in biotechnology
- recognise the uses of each

Method — Why bacteria

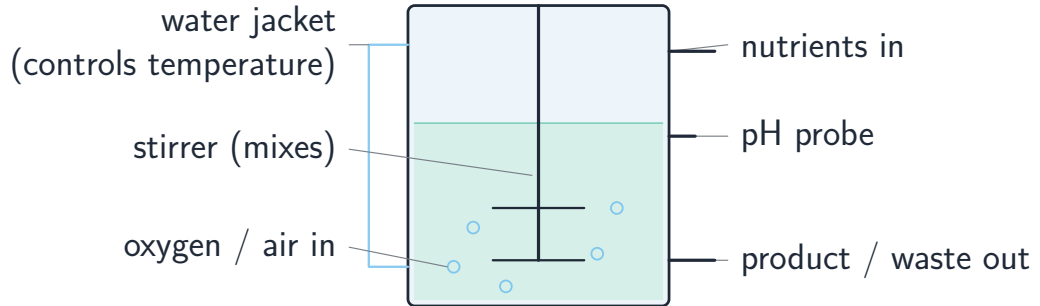
- **bacteria** are useful: reproduce fast, make complex molecules, contain plasmids, few ethical issues.

Method — Why bacteria



Genetic modification: a human gene into a plasmid, made by bacteria

Method — Why bacteria



Biotechnology uses fermenters to grow microbes

Practice 2.1 ■ 1 mark

Define biotechnology.

Solution 2.1

Worked steps

using living things (or their enzymes) to make useful products **B1**.

Practice 2.2 ■ 1 mark

Define genetic modification.

Solution 2.2

Method: Why bacteria

Worked steps

changing an organism's genetic material by removing, changing or inserting genes

B1.

Exam-style 3.1 ■ 1 mark

Bacteria are useful in biotechnology because they:

- A** reproduce slowly
- B** reproduce very fast and contain plasmids
- C** cannot make molecules
- D** have no DNA

Solution 3.1

Method: Why bacteria

- A reproduce slowly
- B reproduce very fast and contain plasmids** 
- C cannot make molecules
- D have no DNA

Worked steps

B. Bacteria reproduce fast and contain plasmids.

Exam-style 3.2 ■ 2 marks

Bacteria are widely used in biotechnology.

- (a) State two reasons why bacteria are suitable.
- (b) State one product made using bacteria.

Solution 3.2

Method: Why bacteria

Worked steps

(a) any two of: reproduce fast; make complex molecules; contain plasmids; few ethical concerns **B1** **B1**.

(b) any of: insulin; penicillin; mycoprotein **B1**.