

Prokaryotic cell structure

Question Paper

Level	Pre U
Subject	Biology
Exam Board	Cambridge International Examinations
Topic	The Cell
Sub Topic	Prokaryotic cell structure
Booklet	Question Paper

Time Allowed: 29 minutes

Score: /24

Percentage: /100

Part - A

- 1 The bacterium *Helicobacter pylori* can colonise the lining of the stomach. It is also found in dental plaque and saliva.
- (a) In some people, infection with *H. pylori* has been associated with changes to the normal structure of the stomach lining and with diseases such as gastric ulcers and stomach cancer.

Fig. 22.1 is a diagram of a longitudinal section of a gastric gland from the stomach of a healthy person. The cells labelled **A**, **B** and **C** each secrete a different product.

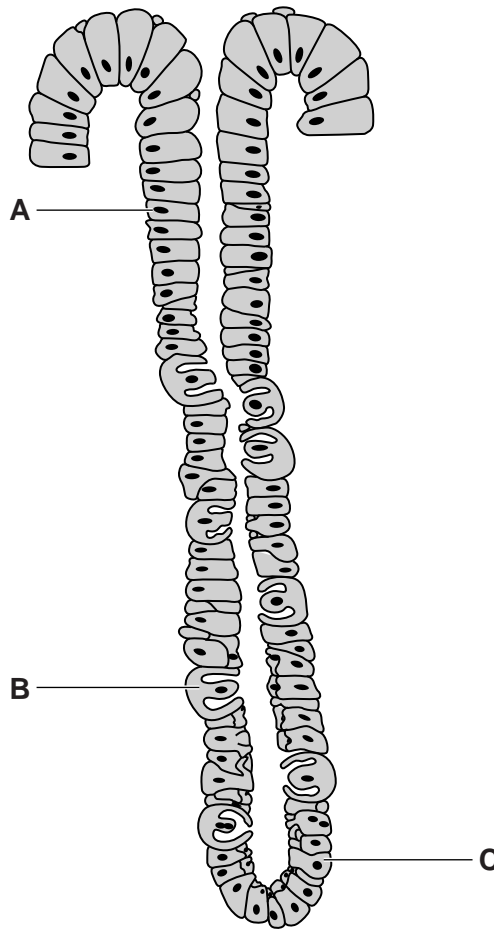


Fig. 22.1

Complete the table to name the cells labelled **A**, **B** and **C** in Fig. 22.1 and state the product secreted by each cell.

cell	name of cell	product secreted by cell
A		
B		
C		

- (b) There are a number of different modes of transmission of *H. pylori* from person to person.

Suggest two ways that *H. pylori* may be transmitted.

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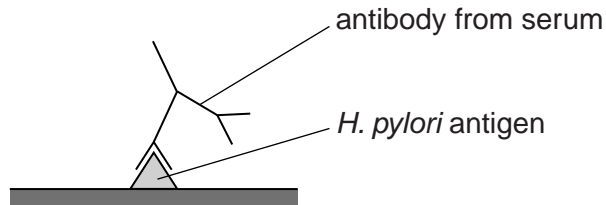
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- (c) An infection with *H. pylori* can be diagnosed by testing for the antibodies produced in response to *H. pylori* antigens, as shown in Fig. 22.2.

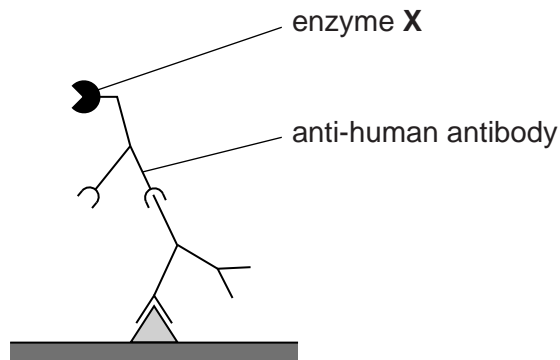
step 1

add blood serum samples to antigens of *H. pylori* attached to wells in a testing plate



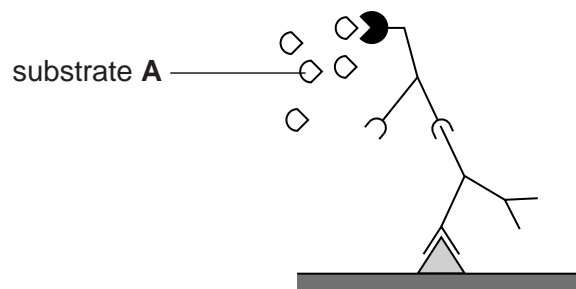
step 2

rinse the testing plate and add anti-human (secondary) antibody linked to enzyme X



step 3

rinse the testing plate and add substrate A, which is converted to a coloured product by enzyme X



step 4

reaction stopped and colour noted

Fig. 22.2

Using Fig. 22.2, explain the importance of the following in this test:

- the use of antibodies
- the rinsing in step 3
- the use of enzyme **X**.

the use of antibodies

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the rinsing in step 3

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the use of enzyme **X**

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- (d) Antibiotics can be used to treat a person with *H. pylori*.

Suggest why a doctor, who has recently prescribed antibiotics to a person infected by *H. pylori*, should not use the test described in (c) to see if *H. pylori* has been eradicated.

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- (e) In some people, *H. pylori* infection can be difficult to treat because, over time, new strains of bacteria arise that have resistance to commonly used antibiotics.

(i) Explain how resistance to antibiotics may arise and spread in a population of bacteria.

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(ii) The antibiotics used to treat *H. pylori* infections disrupt cell wall synthesis and protein synthesis. The same antibiotics have little success at treating gastric infections caused by protists.

Suggest why this is so.

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