

BIOLOGY

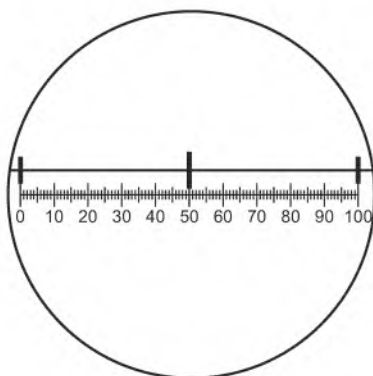
2020 — 2024

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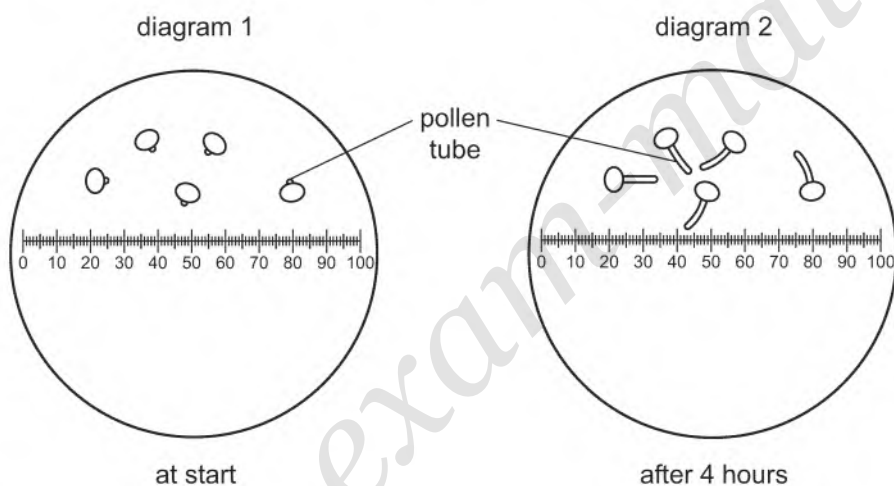
1 - (9700/11_Summer_2020_Q4) - Cell Structure

The diagram shows a graduated slide, with divisions of 0.1 mm viewed using an eyepiece graticule.



Pollen grains were grown in a sugar solution and viewed using the eyepiece graticule.

Diagram 1 shows the pollen grains at the start. Diagram 2 shows the pollen grains after four hours.

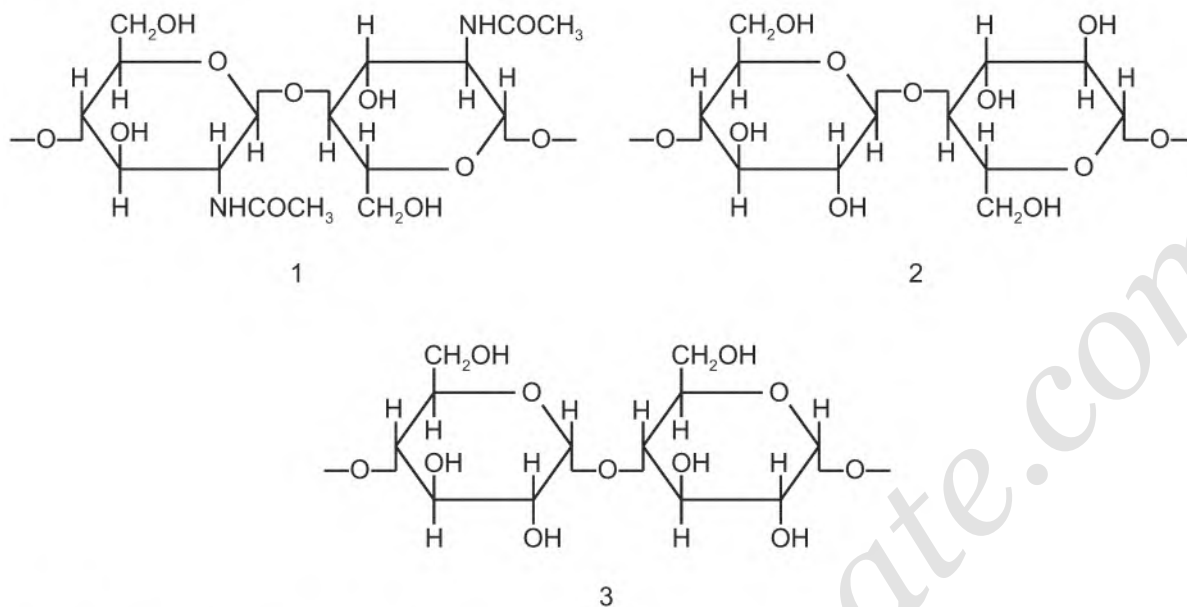


What is the growth rate of the pollen tubes?

- A** $5 \mu\text{mh}^{-1}$ **B** $10 \mu\text{mh}^{-1}$ **C** 5mmh^{-1} **D** 10mmh^{-1}

2 - (9700/11_Summer_2020_Q8) - Cell Structure

The diagrams show short sections of some common polysaccharides and modified polysaccharides.



The polysaccharides can be described as:

- F is composed of β -glucose monomers with 1,4 glycosidic bonds
- G is composed of α -glucose monomers with 1,4 glycosidic bonds
- H is composed of N-acetylglucosamine monomers with β -1,4 glycosidic bonds.

Which row correctly matches the numbered diagrams to the descriptions of the polysaccharides?

	polysaccharide F	polysaccharide G	polysaccharide H
A	2	1	3
B	2	3	1
C	3	1	2
D	3	2	1

3 - (9700/11_Summer_2020_Q9) - Cell Structure

Which molecules contain at least two double bonds?

- 1 unsaturated fatty acid
- 2 collagen
- 3 haemoglobin

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

4 - (9700/11_Summer_2020_Q11) - Cell Structure

Which types of bond will keep a folded protein in its precise shape for the longest time as the temperature rises?

- A disulfide
- B hydrogen
- C hydrophobic interactions
- D ionic

5 - (9700/11_Summer_2020_Q13) - Cell Structure

An enzyme is modified for industrial use. It has a lower Michaelis-Menten constant (K_m) than the unmodified enzyme.

What is true of the modified enzyme?

- A It is more specific.
- B It has a higher affinity for its substrate.
- C It has a lower maximum rate of reaction (V_{max}).
- D It needs more substrate to become saturated.

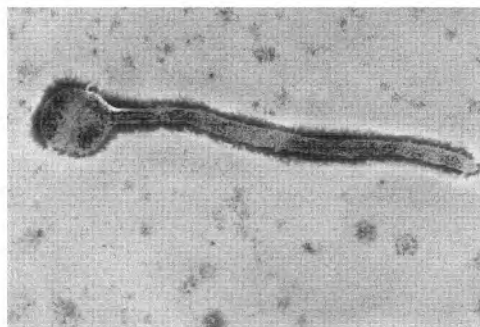
6 - (9700/11_Summer_2020_Q17) - Cell Structure

Which feature of stem cells enables them to replace cells in tissues such as the skin?

- A They are undifferentiated cells that are present at birth.
- B They differentiate to form skin cells.
- C They divide by mitosis to supply some cells that can differentiate.
- D They have the full number of chromosomes.

7 - (9700/12_Summer_2020_Q2) - Cell Structure

The electron micrograph shows a type of virus at a magnification of $\times 30\,000$.



What is the length of the virus?

- A 2.2×10^3 nm
- B 2.2×10^2 nm
- C 2.2×10^1 nm
- D 2.2×10^0 nm

8 - (9700/12_Summer_2020_Q5) - Cell Structure

The features of some cells and cell structures that make ATP are listed.

- 1 has outer boundary membrane and folded inner membrane
- 2 has peptidoglycan cell wall outside an outer boundary membrane
- 3 has a double boundary membrane and stacks of inner membranes

Which row identifies these components?

	1	2	3
A	bacterium	chloroplast	mitochondrion
B	chloroplast	bacterium	mitochondrion
C	chloroplast	mitochondrion	bacterium
D	mitochondrion	bacterium	chloroplast

9 - (9700/12_Summer_2020_Q6) - Cell Structure

Mitochondria are thought to have evolved from prokaryotic cells that were ingested by an ancestral cell.

Which feature have these prokaryotes lost during their evolution into mitochondria?

- A cell wall
- B circular chromosome
- C internal membranes
- D ribosomes

ANSWERS

1 - (9700/11_Summer_2020_Q4) - *Cell Structure*

A

2 - (9700/11_Summer_2020_Q8) - *Cell Structure*

B

3 - (9700/11_Summer_2020_Q9) - *Cell Structure*

A

4 - (9700/11_Summer_2020_Q11) - *Cell Structure*

A

5 - (9700/11_Summer_2020_Q13) - *Cell Structure*

B

6 - (9700/11_Summer_2020_Q17) - *Cell Structure*

C

7 - (9700/12_Summer_2020_Q2) - *Cell Structure*

A

8 - (9700/12_Summer_2020_Q5) - *Cell Structure*

D

9 - (9700/12_Summer_2020_Q6) - *Cell Structure*

A

10 - (9700/12_Summer_2020_Q9) - *Cell Structure*

C