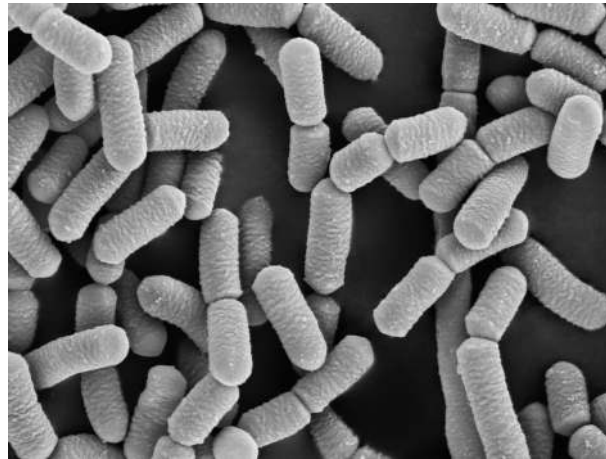


# BACTERIA-VIRUS AND FUNGI

1 Fig. 5.1 shows a species of bacterium, *Lactobacillus bulgaricus*.



**Fig. 5.1**

**(a)** List **two** features that distinguish bacteria from other groups of organisms.

- 1 .....
- 2 ..... [2]

MARKING SCHEME:

<b>(a)</b>	cell wall, peptidoglycan/murein; no nucleus/no nuclear membrane/have nucleoid; loop of DNA; no mitochondria; no chloroplasts; no vacuoles; smaller ribosomes; have pili; have capsule; small/1–2 $\mu\text{m}$ ; <b>A</b> correct reference to size	<b>max 2</b>	<b>A</b> plasmids;
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Bacteria can be grown on nutrient agar in Petri dishes. The main nutrients in the agar are glucose and amino acids. The bacteria reproduce asexually to form colonies. Each colony is formed from one bacterium.

**(a) (i)** Explain why glucose and amino acids are included in the agar medium.

glucose .....

.....

amino acids .....

.....

[2]

**(ii)** Describe how bacteria reproduce asexually.

.....

.....

.....

.....

.....[2]

MARKING SCHEME:

(a) (i)	<i>glucose</i> provides energy/required for (aerobic/anaerobic) respiration ; <i>amino acids</i> used, to make (named), proteins/polypeptides ;	[2]	<b>R</b> to produce / AW, energy <b>A</b> for (cell) growth / make new cytoplasm
(ii)	DNA / chromosome / genetic material, replicates / is copied ; cell membrane / cell wall, develops in the middle of the cell ; binary fission ; bacteria / cell / cytoplasm, divides into two ;	max [2]	<b>ignore</b> mitosis / RNA / chromosomes

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Fig. 1.1 shows a diagram and a photograph of the human immunodeficiency virus (HIV) after release from a human cell.

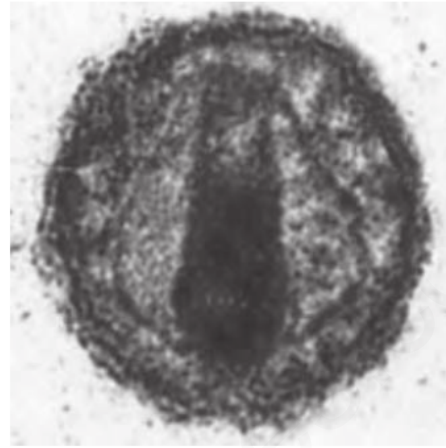
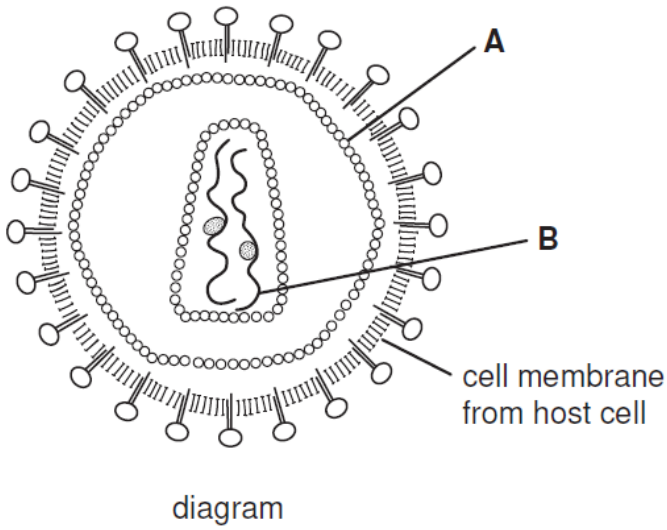


Fig. 1.1

(a) Identify **A** and **B**.

- A** .....
- B** ..... [2]

MARKING SCHEME:

(a)	<b>A</b> protein ; <b>B</b> RNA / nucleic acid ;	[2]	<b>A</b> capsid / protein coat <b>R</b> membrane <b>R</b> capsule, slime coat <b>A</b> DNA
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Viruses can cause diseases.

(a) (i) State **two** other features of all viruses.

1 .....

2 .....

[2]

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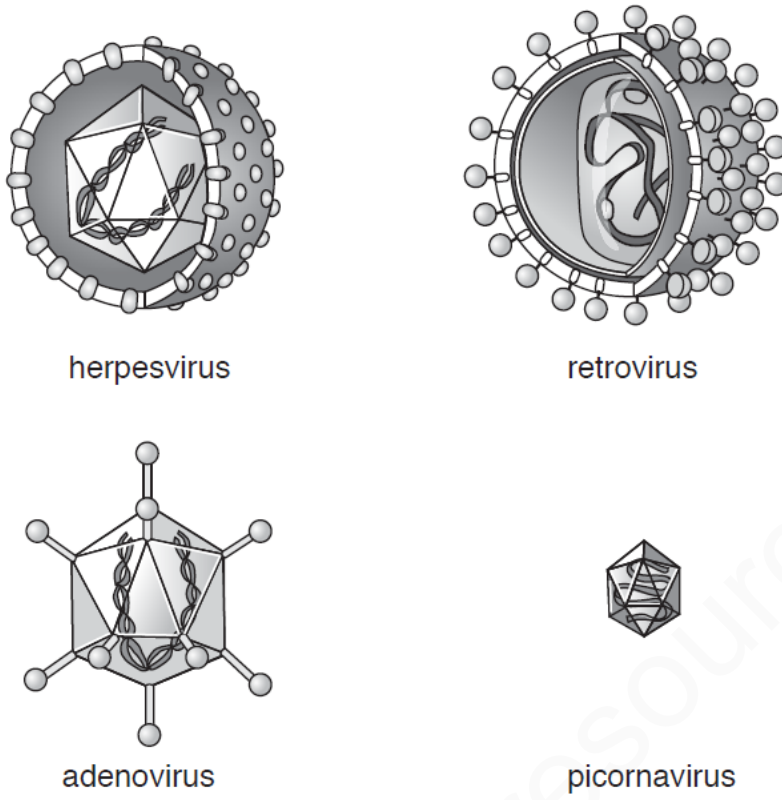
MARKING SCHEME:

genetic material ; protein coat ; parasitic / pathogenic ; only reproduce in a host / do not show (other) features of living organisms / AW ; very small ; they are not cellular / absence of named organelle; AVP ; cannot be killed / cannot be treated, with antibiotics.	<b>2</b>	<b>A</b> DNA / RNA  <b>A</b> virus are non-living.
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Fig. 6.1 shows four different viruses.



**Fig. 6.1**

Suggest **one** feature that could be used to classify viruses into groups.

.....

.....[1]

MARKING SCHEME:

shape / size / AW ; genetic material (sequence / type) ; host species / type of disease it causes ; AVP ;	1	
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6 *Aspergillus* grows over the surface of beans and digests starch. It has a body made of thin threads that secrete enzymes, such as amylase.

(b) Name the thin threads that make up the body of a fungus, such as *Aspergillus*.

..... [1]

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MARKING SCHEME:

hypha(e) ;	[1]
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7 Fungi were often classified as different species according to their visible reproductive structures.

*Penicillium dodgei* and *Eupenicillium brefeldianum* were classified as different species because they had different types of spores.

However, recently it was recognised that the spores of *P. dodgei* were asexual spores, while those of *E. brefeldianum* were sexual spores. A comparison of the DNA of these two fungi shows that they are the same species.

This fungus is now known as *Penicillium brefeldianum*.

(i) Describe how a fungus, such as *P. brefeldianum*, reproduces asexually.

.....

.....

.....

.....

.....

.....

.....

.....[3]

MARKING SCHEME:

1	mitosis ;		
2	no fertilisation ;		
3	budding off (of spores) / fragmentation ;		
4	vertical hyphae ;		
5	production of spores ;		
6	sporangium bursts / opens / releases ;		
7	ref to number of nuclei per spore ;		
8	method of spore dispersal i.e. air / water / wind ;		
9	AVP ; e.g. DNA replication	<b>[max 3]</b>	

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8 Yeast, *Saccharomyces cerevisiae*, is a single-celled fungus.

(a) State **one** reason why yeast is classified as a fungus and **not** as a bacterium.

.....  
.....[1]

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MARKING SCHEME:

have a nucleus; different composition of cell wall; can reproduce sexually; reproduce (asexually) by budding; larger in size; have mitochondria;	<b>max 1</b>	I hyphae A cell wall made of chitin  A bacteria use binary fission
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