

1. Cell structure

Cell structure	Eukaryotic cells		Prokaryotic cells
	plant	animal	
Cell wall	✓	x	✓
Cell surface membrane	✓	✓	✓
Cytoplasm	✓	✓	✓
Nucleus	✓	✓	x
Circular DNA	✓	✓	✓
Centrioles	x	✓	x
Centrosome	x	✓	x
Centromeres	✓	✓	x
Telomeres	✓	✓	x
ER	✓	✓	x
Golgi body	✓	✓	x
80S ribosomes	✓	✓	x
70S ribosomes	✓	✓	✓
Mitochondria	✓	✓	x
Lysosomes	x	✓	x
Vacuoles	✓	✓	✓

Cell organelle	Structure	Function
Centriole	Non-membrane bound, cylindrical structures	Organises microtubules to produce the spindle during cell division
Golgi body	Membrane-bound sacs, arranged as a flattened stack	<ul style="list-style-type: none"> - Packaging of hydrolytic enzymes that will remain in the cell - Makes lysosomes
Nuclear envelope &	A double membrane with many pores	mRNA passes through to the ribosome

nuclear pores		
Ribosomes	Non-membrane bound, spherical structures	Synthesis of polypeptides / Site of protein synthesis
Endoplasmic reticulum	Membrane which surround an enclosed inner cavity	Synthesis of lipids

1.

Microvilli and root hairs are characteristic structures of some cell types.

Which row identifies some features of a microvillus and a root hair?

	surrounded by cell wall	more than one present on a cell
A	root hair	microvillus
B	microvillus	microvillus
C	root hair	root hair
D	microvillus	root hair

Ans: A

1.

Which eukaryotic cell structures all contain nucleic acids?

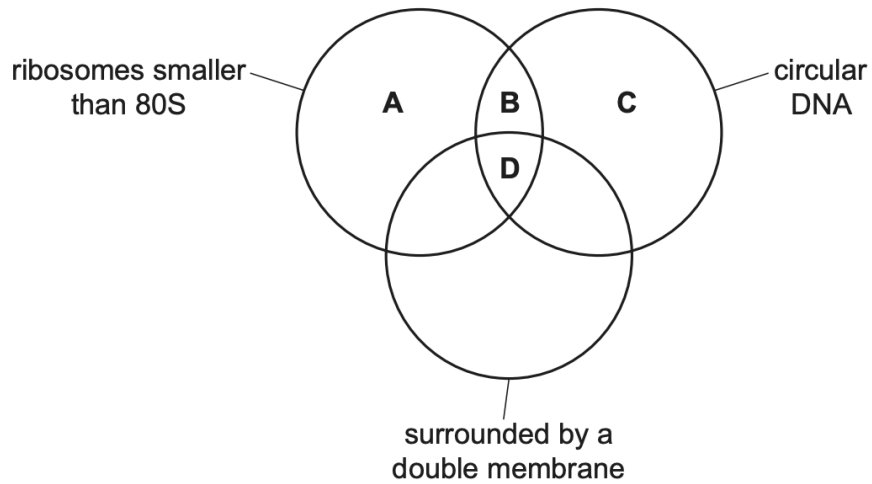
- A** cytoplasm, Golgi bodies, mitochondria, nuclei
- B** centrioles, chloroplasts, mitochondria, ribosomes
- C** centrioles, mitochondria, nuclei, ribosomes
- D** chloroplasts, mitochondria, cytoplasm, ribosomes

Ans: D

- Chloroplasts and mitochondria contain circular DNA
- Ribosomes contain rRNA
- Cytoplasm contains RNA
- Centrioles and centrosomes do not contain any DNA!

2.

What are features of prokaryote cells, chloroplasts and mitochondria?



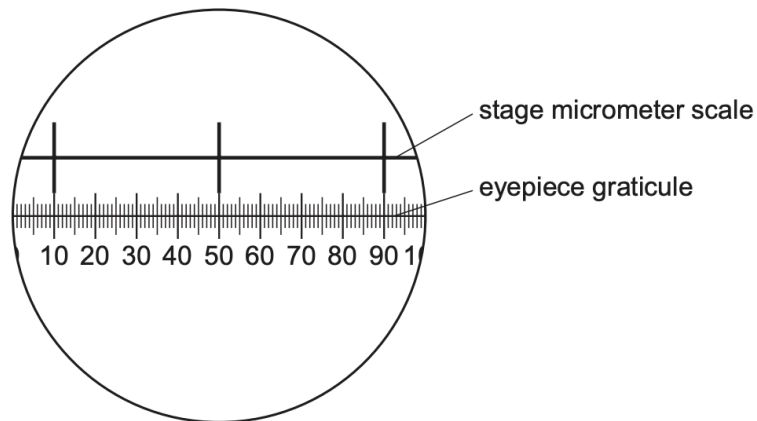
Ans: B

NOTE: prokaryotic cells do not have a double membrane!! They have a single membrane!

3.

A student used a stage micrometer scale to calibrate an eyepiece graticule.

The diagram shows the view of both the stage micrometer scale and the eyepiece graticule seen by the student. The divisions on the stage micrometer scale are 0.1 mm apart.



The student removed the stage micrometer scale and viewed a slide with blood cells on it. The same lenses were used so that the magnification remained unchanged.

The student measured the diameter of one of the white blood cells on the slide using the eyepiece graticule and recorded that it was 8 eyepiece units.

What is the correct diameter of this white blood cell in micrometers?

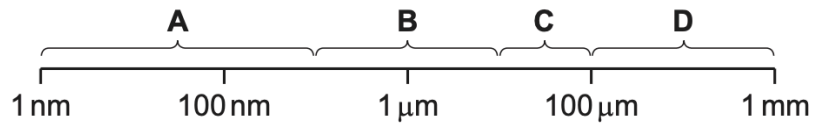
- A** 0.2 **B** 0.8 **C** 20 **D** 800

Ans: C

- 80 eyepiece graticule divisions = $2 \times 0.1 = 0.2\text{mm}$
- 8 eyepiece graticule decisions = $0.2 / 10 = 0.02\text{mm} = 20\mu\text{m}$

4.

Which size range would include most prokaryotic cells?



Ans: B

NOTE:

- Prokaryotic cells = 0.1 to 5.0 μm
- Eukaryotic cells = 10 to 100 μm

5.

A specimen is observed twice with a microscope, firstly using green light with a wavelength of 510 nm and then using red light with a wavelength of 650 nm.

What happens to the magnification and resolution when using red light compared to green light?

	magnification	resolution
A	decreases	remains the same
B	increases	increases
C	remains the same	decreases
D	remains the same	increases

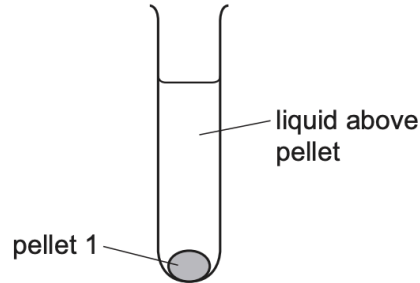
Ans: C

NOTE: shorter wavelength = higher resolution

6.

An experiment was carried out to separate the cell structures in an animal cell.

The cells were broken open. The extract was filtered and put into a centrifuge tube. This tube was then spun so that the heaviest cell structure sank to the bottom first, forming pellet 1, as shown.



The liquid above pellet 1 was poured into a clean centrifuge tube and spun again at a higher speed to separate the next heaviest cell structure. This cell structure sank to the bottom, forming pellet 2.

This procedure was repeated twice to obtain pellet 3 and pellet 4, each containing a single cell structure.

What is a function of the cell structure extracted in pellet 1?

- A digestion of old organelles
- B production of ATP
- C production of mRNA
- D synthesis of protein

Ans: C

- Pellet 1 = heaviest organelle
- Production of mRNA = nucleus, which is the heaviest

7.

Which row shows a comparison that is **not** correct between a typical prokaryotic cell and a typical eukaryotic plant cell?

	prokaryotic cell	eukaryotic plant cell
A	DNA not associated with histones	DNA associated with histones
B	no endoplasmic reticulum present	endoplasmic reticulum present
C	peptidoglycan cell walls	cellulose cell walls
D	all ribosomes approximately 18 nm in diameter	all ribosomes approximately 22 nm in diameter

Ans: D

All ribosomes in eukaryotes are not 22nm! They also contain 18nm ribosomes

8.

It is suggested that primitive prokaryotic cells may be ancestors of certain organelles in eukaryotic cells.

Which organelle is most similar in composition to a typical prokaryote?

- A Golgi bodies
- B lysosomes
- C mitochondria
- D nucleoli

Ans: C

9.

A student calibrated an eyepiece graticule using a stage micrometer.

- Each division of the stage micrometer was 0.01 mm.
- With a $\times 10$ magnification objective lens, 10 eyepiece graticule units matched 10 divisions on the stage micrometer.

The same microscope was used with a $\times 40$, instead of a $\times 10$, magnification objective lens to measure the diameter of an alveolus. The diameter of the alveolus was found to be 96 eyepiece graticule units.

The eyepiece lens was not changed.

What is the best estimate for the diameter of the alveolus?

- A 0.960 mm B 3.84 mm C 240 μm D 384 μm

Ans: C

magnification affects divisions seen on stage micro,
but not graticule

at $\times 10$, 10 graticule div = 10 micrometer div
1 graticule div = 10 micrometer div

at $\times 40$, 1 graticule div = $\frac{10}{40} = 0.25$ micrometer div

\therefore 96 graticule = 0.25×96 micrometer div
= $(0.25 \times 96 \times 0.01) \times 1000 = 240 \mu\text{m}$

10.

Which statements are correct for chloroplasts and also for mitochondria?

- 1 They contain 80S ribosomes.
- 2 They can transcribe their circular DNA.
- 3 They can translate mRNA.
- 4 They are enclosed by double membranes.

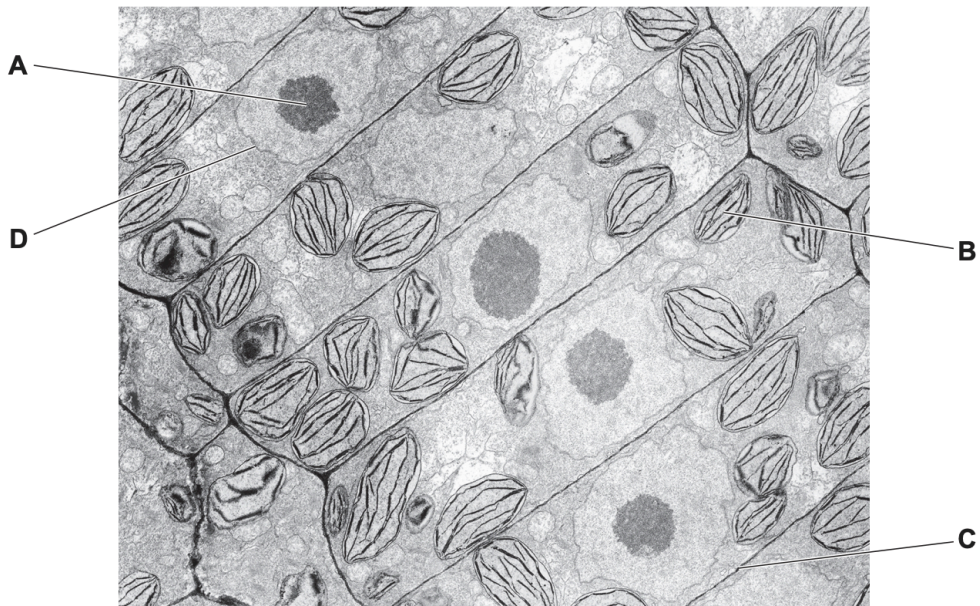
- A** 1, 2, 3 and 4
B 1 and 2 only
C 2, 3 and 4 only
D 3 and 4 only

Ans: C

11.

The electron micrograph shows some cells from a root.

Which cell structure is **not** usually found in cells from a root?



Ans: B

12.

Dialysis (Visking) tubing is an artificial partially permeable membrane with pore sizes of approximately 2.5 nm. Glucose molecules have a diameter of about 1.5 nm and can pass through the pores in the membrane.

What else can pass through the pores?

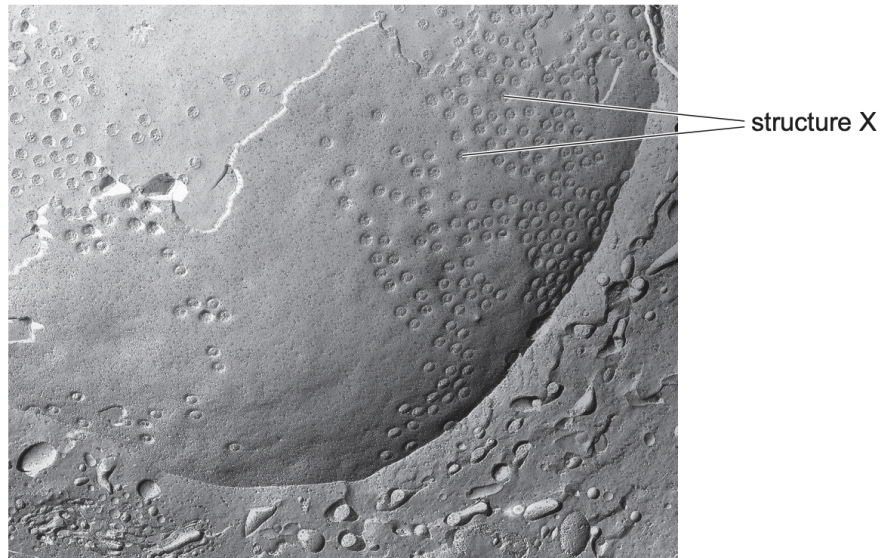
- 1 bacteria
- 2 haemoglobin
- 3 ribosomes
- 4 fructose

A 1 and 3 **B** 2 and 4 **C** 2 only **D** 4 only

Ans: D

13.

The electron micrograph shows onion root cells prepared using a freeze-fracture technique. The cells were quickly frozen and then physically broken apart. Freeze fracture breaks apart cells along weak areas, such as membranes and the surfaces of organelles.



×20 000

Which statement best explains the appearance of the electron micrograph?

- A** The cells were broken apart at the endoplasmic reticulum; structure X is a ribosome.
- B** The cells were broken apart at the nuclear envelope; structure X is a nuclear pore.
- C** The cells were broken apart at the nuclear envelope; structure X is a ribosome.
- D** The cells were broken apart at the tonoplast; structure X is a plasmodesma.

Ans: B

14.

Which cell structures can form vesicles?

	cell surface membrane	endoplasmic reticulum	Golgi body
A	✓	✓	✓
B	✓	✓	X
C	✓	X	✓
D	X	✓	✓

key

✓ = can form vesicles

X = cannot form vesicles

Ans: A

15.

Which cells contain a tonoplast?

	root hair	companion	sieve tube element	endodermis
A	✓	✓	✓	✓
B	✓	X	✓	✓
C	X	✓	✓	X
D	✓	✓	X	✓

key

✓ = contain tonoplast

X = do not contain tonoplast

Ans: D

NOTE: sieve tube elements don't have nucleus, ribosomes, tonoplast, microtubules

16.

Some scientists think that mitochondria evolved from bacteria that entered the cytoplasm of a different cell and were able to survive there.

Which structural features of mitochondria support this hypothesis?

	folded internal membrane	circular DNA	70S ribosomes
A	✓	✓	✓
B	✓	✓	X
C	✓	X	✓
D	X	✓	✓

key

✓ = supports

X = does not support

Ans: D

17.

A student used a light microscope to observe a blood smear on a microscope slide.

An eyepiece graticule was used to measure the diameter of a white blood cell on the slide. The student recorded that the white blood cell was 5 eyepiece graticule units in diameter.

Which additional information does the student need to determine the diameter of the white blood cell in micrometres?

- A** calibration of the eyepiece graticule using a stage micrometer only
- B** calibration of the eyepiece graticule using a stage micrometer and the magnification of the eyepiece lens
- C** the magnification of the eyepiece lens only
- D** the magnification of the eyepiece lens and the magnification of the objective lens

Ans: A

18.

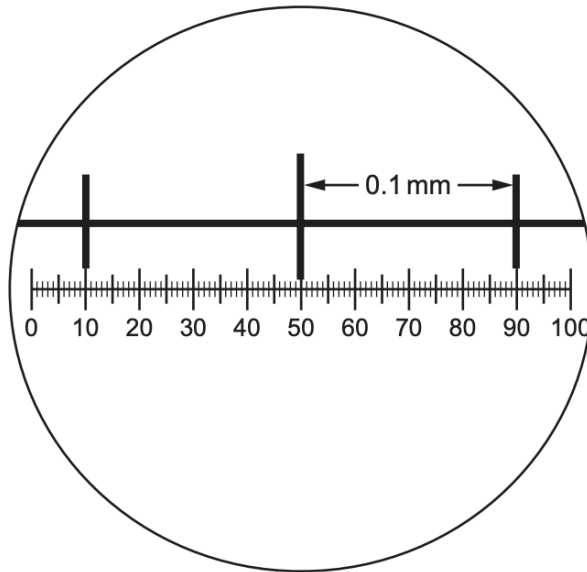
Which statement explains why it is necessary to use an electron microscope to see the cristae of a mitochondrion?

- A** The magnification of the electron microscope is greater than that of the light microscope.
- B** The membranes of the cristae are separated by a distance greater than 200 nm.
- C** The maximum resolution of a microscope using visible light is too low.
- D** The wavelength of an electron beam is longer than the wavelength of visible light.

Ans: C

19.

The diagram shows a stage micrometer scale viewed with an eyepiece graticule, using a magnification of $\times 200$.



Using the same magnification, a chloroplast is measured as 4 eyepiece graticule divisions long.

How long is the chloroplast?

- A $1.0 \times 10^1 \mu\text{m}$
- B $4.0 \times 10^2 \mu\text{m}$
- C $2.5 \times 10^{-1} \mu\text{m}$
- D $2.5 \times 10^{-2} \mu\text{m}$

Ans: A

20.

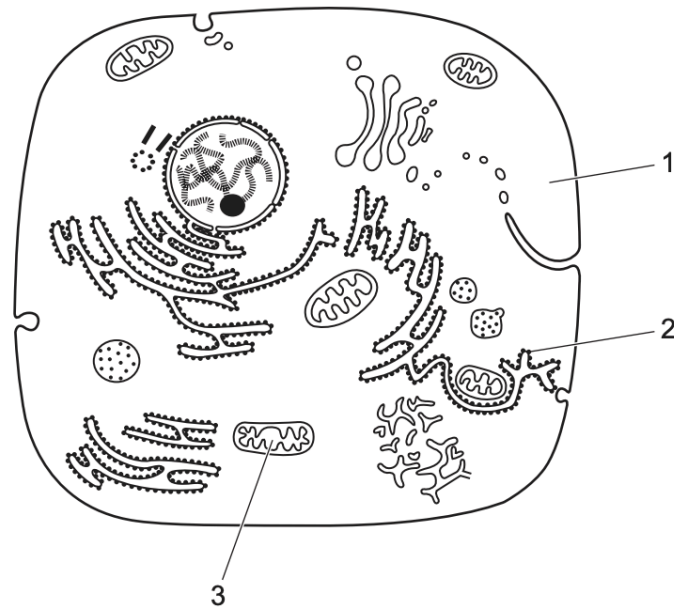
Which range of cell diameters is typical for prokaryotic cells?

- A 1 nm to 5×10^2 nm
- B 1×10^3 nm to $5 \mu\text{m}$
- C $1 \times 10^1 \mu\text{m}$ to $5 \times 10^2 \mu\text{m}$
- D $1 \times 10^2 \mu\text{m}$ to $5 \times 10^3 \mu\text{m}$

Ans: B

21.

The diagram shows a typical animal cell.



Where would nucleic acids be found?

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

Ans: A

NOTE:

Nucleic acids are found in the nucleus, cytoplasm, mitochondria, chloroplast, ribosome

22.

Which structure is found in a typical bacterial cell?

- A** intron
B telomere
C template strand
D capsid

Ans: C

NOTE:

Bacterial cells don't contain telomeres as they don't have linear DNA/ chromosomes

23.

Which row about typical prokaryotic cells **and** typical animal cells is correct?

	lysosomes present for the break down of old organelles	ATP is produced by the cell
A	✓	x
B	✓	✓
C	x	✓
D	x	x

key

✓ = correct for typical prokaryotic cells **and** typical animal cells

x = **not** correct for both cells but correct for **either** typical prokaryotic cells **or** typical animal cells

Ans: C

NOTE: bacteria produce ATP although they don't have mitochondria. Bacteria synthesize proteins, and this process requires ATP!!

24.

Which statements about peptide bond formation are correct?

- 1 The bond formation occurs between a carbon of one amino acid and a nitrogen of the next amino acid after the amino acids detach from tRNA.
- 2 The bond formation occurs at the ribosome while the amino acids are still attached to tRNA, and is a hydrolysis reaction.
- 3 The bond formation is important for growth of an organism and when the bond forms, a water molecule is removed.

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

Ans: D

25.

An eyepiece graticule can be calibrated using a stage micrometer.

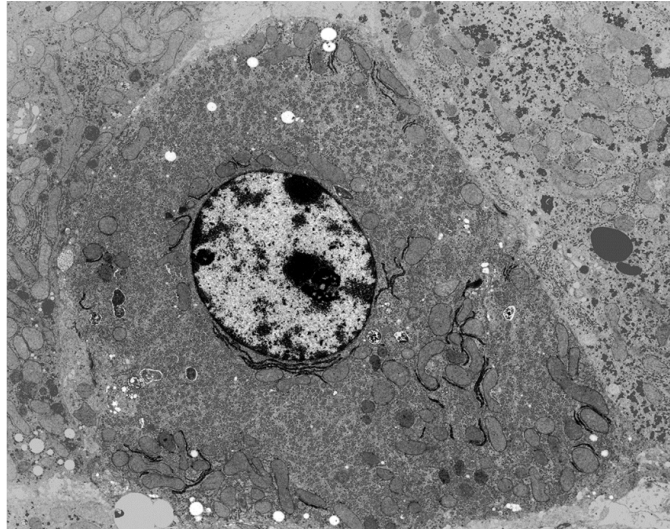
What is the correct reason why an eyepiece graticule is calibrated?

- A** An eyepiece graticule can be used to make measurements.
- B** An eyepiece graticule is magnified by the objective lens.
- C** An eyepiece graticule magnifies the specimen.
- D** An eyepiece graticule makes comparisons.

Ans: A

26.

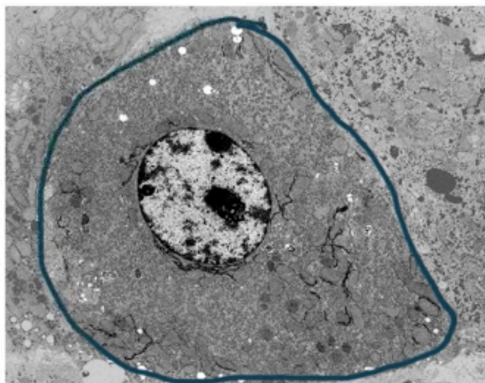
The image is an electron micrograph of a typical eukaryotic cell.



What can be concluded about the eukaryotic cell from the electron micrograph?

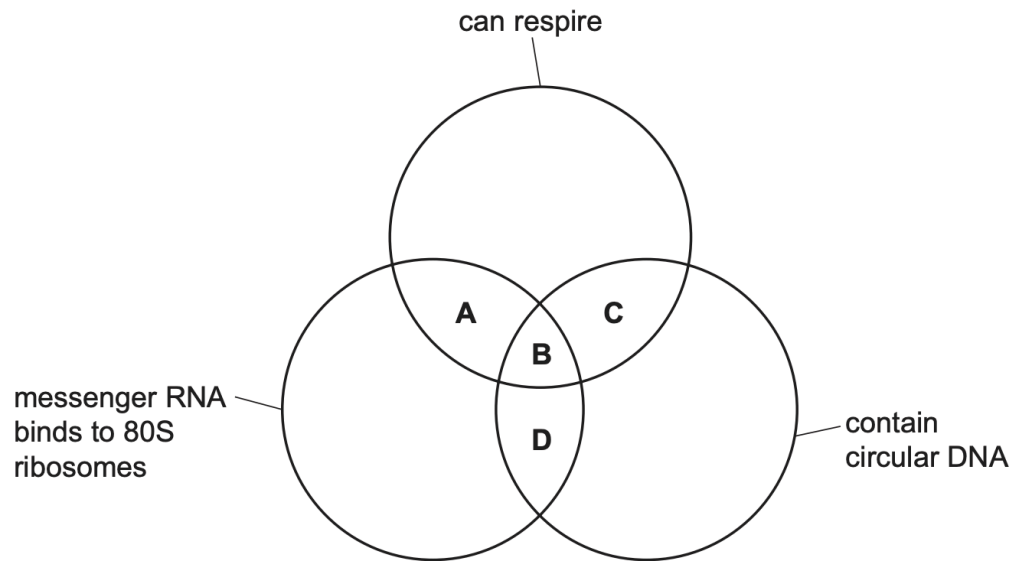
- A** It is an animal cell because it does **not** have a cell wall.
- B** It is an animal cell because it contains a permanent vacuole.
- C** It is a plant cell because it contains many chloroplasts.
- D** It is a plant cell because it contains many lysosomes.

Ans: A



27.

Which features are found in typical eukaryotes **and** also in typical bacteria?



Ans: C

NOTE: bacterial cells can respire by anaerobic respiration!

28.

Which type of cell will have the highest proportion of its volume taken up with cell structures bound by a single membrane?

- A ciliated epithelial cell
- B goblet cell
- C red blood cell
- D companion cell

Ans: B

- Goblet cells make mucus/ glycoprotein, so there is a large amount of RER and golgi body, which are bound by a single membrane.

29.

Which statement supports the fact that mature plant cells contain organelles that carry out the same role as lysosomes?

- A A range of hydrolytic enzymes can be found within mature plant vacuoles.
- B Glycogen, found within vesicles, can be hydrolysed to glucose molecules.
- C Double membrane-bound vesicles are formed from plant Golgi bodies.
- D Vesicles, formed from the cell surface membrane, contain enzymes.

Ans: A

Glycogen is not found in plant cells!

30.

Which cell structures may contain cisternae?

	chloroplast	endoplasmic reticulum	Golgi body	mitochondrion
A	✓	✓	✓	x
B	✓	x	x	✓
C	x	✓	✓	x
D	x	✓	x	✓

key

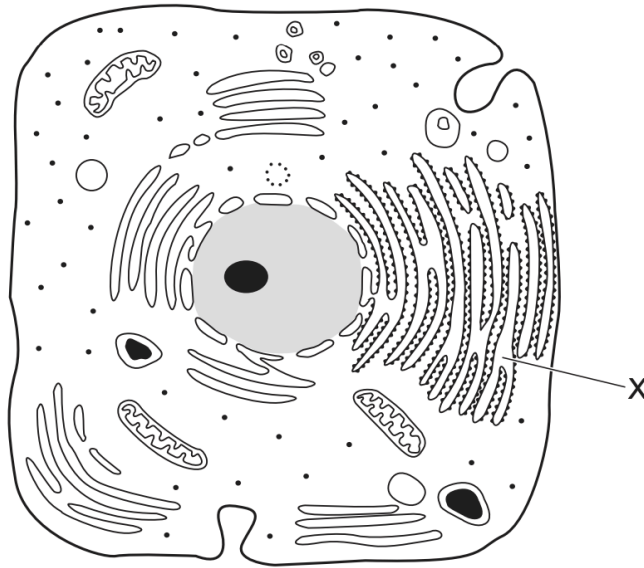
✓ = may contain cisternae

x = does **not** contain cisternae

Ans: C

31.

The diagram shows a typical animal cell.



What is the function of the membrane system labelled X?

- A lipid synthesis only
- B protein synthesis and transport
- C protein synthesis only
- D protein transport only

Ans: B

Whenever question asks for function of RER, function of ribosome should also be accounted for

32.

What describes a lysosome?

- A a vesicle containing enzymes, enclosed by a double membrane, that is budded off the endoplasmic reticulum
- B a vesicle containing hydrolytic enzymes and surrounded by a single membrane, found only in phagocytes
- C a vesicle enclosed by a single membrane, containing several different hydrolytic enzymes that may act inside or outside the cell
- D a vesicle surrounded by a double membrane, containing enzymes which can hydrolyse damaged organelles in a cell

Ans: C

33.

Which cell structures can have mRNA inside them?

- 1 chloroplast
- 2 mitochondrion
- 3 nucleus
- 4 rough endoplasmic reticulum

- A** 1, 2, 3 and 4
B 1, 2 and 3 only
C 2, 3 and 4 only
D 3 and 4 only

Ans: B

34.

Which structures are found in palisade mesophyll cells **and** photosynthetic prokaryotes?

- 1 cell surface membrane
- 2 cellulose wall
- 3 ribosomes
- 4 chloroplasts

- A** 1, 2, 3 and 4
B 1, 2 and 3 only
C 1 and 3 only
D 2 and 4 only

Ans: C

1.

Which cell structures can form vesicles?

	cell structure		
	cell surface membrane	endoplasmic reticulum	Golgi body
A	✓	✓	✓
B	✓	✓	x
C	✓	x	✓
D	x	✓	✓

key

✓ = can form vesicles

x = cannot form vesicles

Ans: A

Cell structures that form vesicles

Cell surface membrane, endoplasmic reticulum, and Golgi body can form vesicles.

- The process by which the cell membrane forms vesicles is known as endocytosis.
- Vesicles can also fuse with the cell membrane and release their contents to the outside = exocytosis.

2.

Which cell structures contain RNA?

- 1 centrioles
- 2 mitochondria
- 3 nucleus
- 4 ribosomes

- A** 1, 2, 3 and 4
B 1 and 2 only
C 2, 3 and 4 only
D 3 and 4 only

Ans: C

Cell structures containing RNA

RNA is found everywhere in the cell - nucleus, nucleolus, mitochondria, chloroplasts, ribosomes, cytoplasm, etc. RNAs are of 3 types- mRNA, rRNA, and tRNA.

- mRNA and tRNA are found in the cytoplasm
- rRNA is found in the nucleus.

- Mitochondria possess their own set of tRNAs, rRNAs and mRNAs = these are needed to make proteins.
- A ribosome is made up of RNA and proteins. The small and big subunits of each ribosome are two distinct RNA-protein complexes.
- Centrioles do not contain any nucleic acids.

3.

It is possible for a bacterium to synthesise a eukaryotic protein.

This involves introducing a eukaryotic gene into the bacterial DNA. The eukaryotic gene is then translated by the bacterium.

What explains why a bacterial cell can produce a eukaryotic protein but cannot produce a eukaryotic glycoprotein?

- A Bacteria do not have rough endoplasmic reticulum.
- B Bacteria do not have a nuclear envelope.
- C Bacteria do not have mitochondria.
- D Bacteria do not have Golgi bodies.

Ans: D

4.

Which structures are found in typical eukaryotic cells?

- 1 70S ribosomes
- 2 80S ribosomes
- 3 linear DNA (chromosomes)
- 4 circular DNA

- A 1, 2, 3 and 4
- B 1, 2 and 3 only
- C 1 and 4 only
- D 2 and 3 only

Ans: A

5.

The table shows a comparison between two features of a typical eukaryotic cell and a typical prokaryotic cell.

Which row shows the correct comparison between these cells?

	presence of centromeres		presence of telomeres	
	eukaryotic cell	prokaryotic cell	eukaryotic cell	prokaryotic cell
A	✓	✓	x	x
B	✓	x	✓	x
C	x	✓	x	✓
D	x	x	✓	✓

key

✓ = present

x = not present

Ans: B

NOTE: chloroplast produces ATP

6.

A molecule of carbon dioxide is in the centre of a mitochondrion.

Assuming there are no other cell structures in its path, how many phospholipid layers will the carbon dioxide molecule have to pass through in order to leave the cell?

A 2 **B** 3 **C** 6 **D** 8

Ans: C

- The mitochondrion has a double membrane = 2 phospholipid bilayers = 4 phospholipid layers
- The cell membrane has 1 phospholipid bilayer = 2 phospholipid layers
- 4 + 2 = 6 phospholipid layers

7.

Insulin is a hormone synthesised from two polypeptide chains inside cells of the pancreas.

Which row shows the cell structures that are used in producing insulin and releasing it from the cells?

	Golgi body	lysosome	rough endoplasmic reticulum
A	✓	✓	x
B	✓	✓	✓
C	✓	x	✓
D	x	✓	✓

key

✓ = used

x = not used

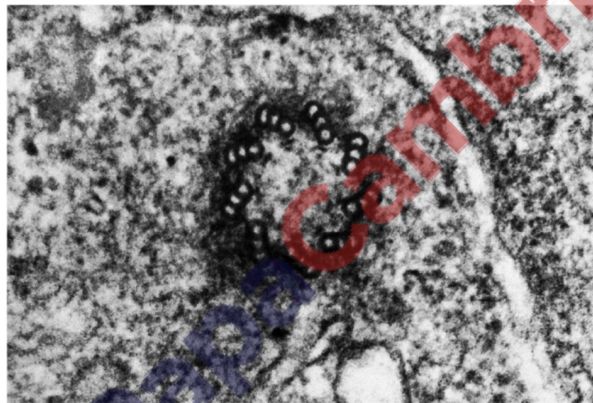
Ans: C

Steps involved in synthesising and releasing proteins from the cell

1. Nucleus
2. Cytoplasm
3. Ribosomes
4. Golgi body
5. Vesicles

8.

The electron micrograph shows a cell structure in a eukaryotic cell.



Which statements about this cell structure are correct?

- 1 ATP is synthesised in this cell structure.
- 2 The cell structure is made of protein molecules.
- 3 The cell structure replicates during interphase of the cell cycle.

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

Ans: C

9.

The DNA of typical prokaryotes is naked and circular.

Which statement describes how the DNA of eukaryotes differs from the DNA of typical prokaryotes?

- A Only DNA of eukaryotes has a nuclear envelope around it and is a double helix.
- B Only DNA of eukaryotes has a nuclear envelope around it and is circular.
- C Only DNA of eukaryotes has proteins attached to it and is a double helix.
- D Only DNA of eukaryotes has proteins attached to it and is linear.

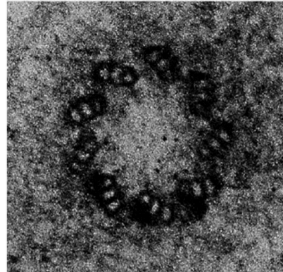
Ans: D

- DNA of eukaryotes = linear (& circular - in mitochondria & chloroplasts);
DNA of prokaryotes = circular

- DNA of eukaryotes has proteins attached while DNA of prokaryotes doesn't
- DNA of both eukaryotes & prokaryotes is double helix

10.

The electron micrograph shows a structure found in the cytoplasm of an animal cell.



Which biological molecules are found in this structure?

- 1 nucleic acid
- 2 protein
- 3 phospholipid

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

Ans: D

- Centrioles don't contain any nucleic acids.
- Centrioles contain tubulin protein.
- Centrioles don't contain phospholipids, as they are non-membrane bound structures.

11.

Which are found in **typical** prokaryotic cells **and** in typical plant cells?

- 1 cell wall
- 2 circular DNA
- 3 cytoplasm

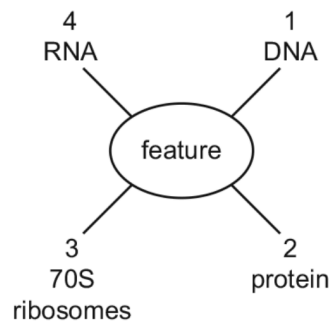
A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

Ans: A

Circular DNA in plant cells is found in chloroplasts & mitochondria.

12.

The diagram shows some features that occur in organisms.



Which features can be present in viruses?

- A** 1, 2 and 3 **B** 1, 2 and 4 **C** 1, 3 and 4 **D** 2, 3 and 4

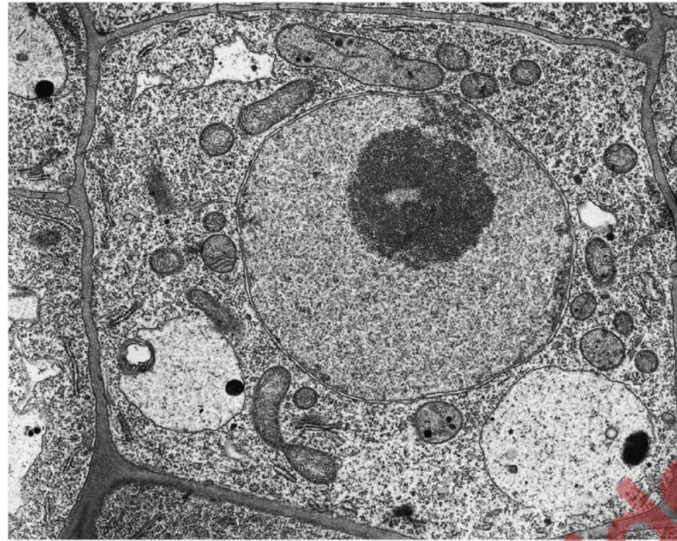


Ans: B

Viruses do not possess ribosomes and cannot independently form proteins from molecules of messenger RNA.

13.

The electron micrograph shows some cell structures.



Some cell structures are listed.

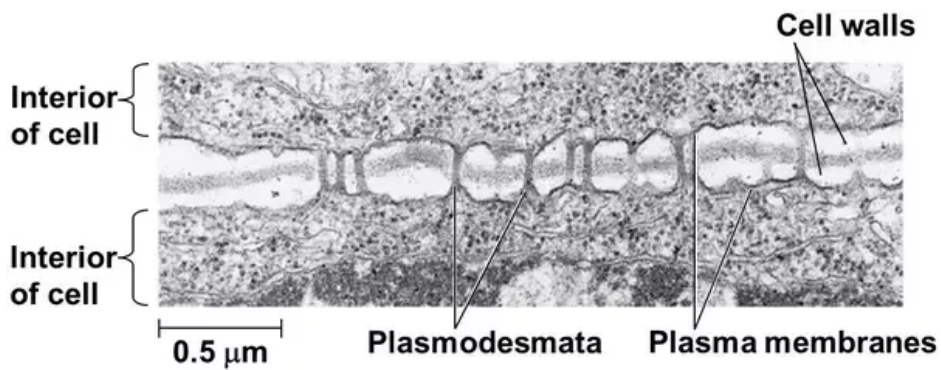
- 1 nucleolus
- 2 chloroplast
- 3 microtubules
- 4 ribosomes
- 5 mitochondria
- 6 plasmodesmata

Which cell structures can be seen in the electron micrograph?

- A 1, 2, 3 and 4 B 1, 4, 5 and 6 C 2, 3, 5 and 6 D 2, 4, 5 and 6

Ans: B

Lines can be seen cutting through the cell wall. These are the plasmodesmata.





14.

Which statements about ATP are correct?

- 1 It is produced in chloroplasts.
- 2 It is used during protein synthesis.
- 3 It contains deoxyribose.
- 4 It is used in facilitated diffusion.
- 5 It is used to load sucrose into companion cells.

A 1, 2 and 5 **B** 1, 3 and 5 **C** 2, 3, 4 and 5 **D** 2 and 4 only

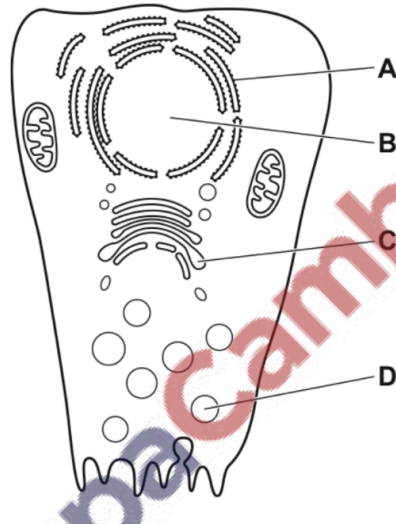
Ans: A

- ATP is produced in chloroplasts by photosynthesis.
- ATP has many roles in protein synthesis: recycling of nucleotides used in mRNA synthesis, adding a specific amino acid to tRNA molecules, etc.
- A DNA nucleotide contains the sugar deoxyribose, whereas an ATP molecule contains the sugar ribose.
- Facilitated diffusion = the transport of molecules from the region of higher concentration to the region of lower concentration with the help of carriers. This process DOES NOT require energy.
- Moving sucrose from the apoplast into the companion cell is a process that requires energy.

15.

Radioactively labelled amino acids are introduced into a cell that is actively secreting an enzyme.

In which cell structure will the radioactivity first become concentrated?



Ans: A

When radioactive amino acids are introduced into the cell, they will be first incorporated into protein by ribosomes.

16.

Ribosomes exist as separate subunits that are bound together during protein synthesis.

What do these subunits consist of?

- A mRNA and protein
- B mRNA and tRNA
- C rRNA and protein
- D rRNA and tRNA

Ans: C

17.

Which features of cilia and root hairs are correct?

	increase cell surface area	cannot be resolved with the light microscope	contain vacuoles	more than one present on a cell
A	cilia	cilia	root hairs	root hairs
B	cilia	root hairs	cilia	cilia
C	root hairs	cilia	root hairs	cilia
D	root hairs	root hairs	cilia	root hairs

Ans: C

18.

Which are functions of microtubules?

- 1 allowing movement of cilia in a bronchus
- 2 attachment of centromeres during metaphase
- 3 moving secretory vesicles around a cell

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

Ans: A

19.

Which cell structures have ribosomal RNA (rRNA)?

- 1 chloroplast
- 2 mitochondrion
- 3 nucleus
- 4 rough endoplasmic reticulum

A 1, 2, 3 and 4
B 1, 2 and 3 only
C 1, 2 and 4 only
D 2, 3 and 4 only

Ans: A

All structures with ribosomes will have ribosomal RNA.

20.

A cell structure in the macrophage destroys bacteria. Some bacteria stop this cell structure from functioning.

Which cell structure in the macrophage is stopped from functioning by the bacteria?

- A Golgi body
- B lysosome
- C ribosome
- D vesicle

Ans: B

21.

Two different types of cell, P and Q, were broken up using ultrasound and their contents analysed. Both types of cell contained small circular DNA. The circular DNA from P all carried the same base sequence, but those from Q were of two types, with different base sequences.

What may be concluded about the identity of cell types P and Q?

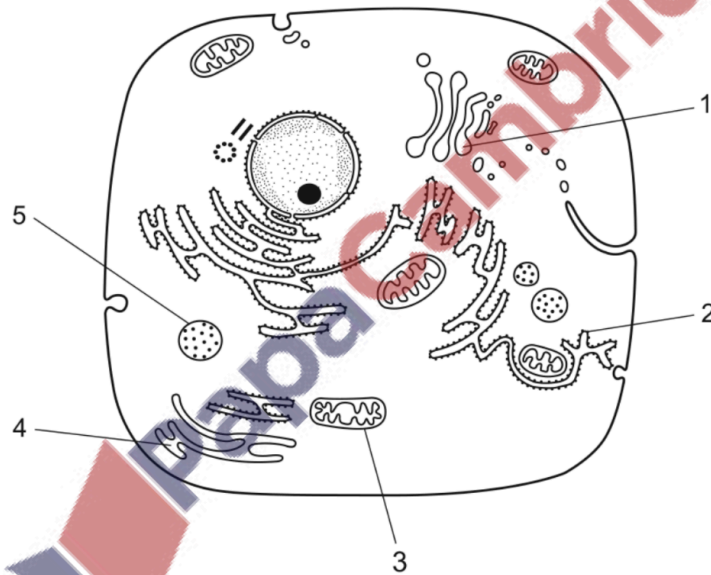
	P	Q
A	heart muscle fibres	root cortical cells
B	lymphocytes	mature red blood cells contaminated by bacteria
C	mature red blood cells	phloem sieve tube element
D	root cortical cells	leaf mesophyll cells

Ans: D

Mitochondria have their own small circular DNA. RBCs are enucleated and lack mitochondria as well. So, option B and C cannot be correct. There are two types of mesophyll cells in the leaves (palisade mesophyll and spongy mesophyll), each having nuclear as well as mitochondrial DNA. Thus, Q can be leaf mesophyll cells. As DNA from P was of one type only, it can be root cortical cells.

22.

The diagram shows a typical animal cell as seen using an electron microscope.



Which of the numbered structures are needed for proteins to be secreted at the cell surface membrane?

- A** 2, 3, 4 and 5 **B** 1, 2 and 4 **C** 1 and 3 **D** 5 only

Ans: C

Golgi apparatus carries proteins to the cell surface membrane.

23.

Which cell structure contains cytoplasm?

- A** chloroplasts
B mitochondria
C plasmodesmata
D smooth endoplasmic reticulum

Ans: C

24.

Some cell structures are listed in a particular order.

- 1 nucleus
- 2 ribosome
- 3 Golgi body
- 4 vesicle

What determines the order in which these cell structures are listed?

- A** sequence used in synthesis of a lipid
- B** sequence used in synthesis of an antibody
- C** size from largest to smallest
- D** size from smallest to largest



Ans: B

25.

The antibiotic chloramphenicol inhibits protein synthesis in mitochondria and in some prokaryotes. Chloramphenicol does **not** inhibit protein synthesis in the cytoplasm of eukaryotic cells.

What would be the effect on the cells of a person being treated with chloramphenicol?

	rate of ATP production	transcription of nuclear DNA
A	decreases	decreases
B	decreases	no effect
C	increases	decreases
D	no effect	no effect

Ans: A

26.

Which structures are found in animal cells and in plant cells?

- 1 centriole
- 2 lysosome
- 3 nucleolus
- 4 vacuole

- A 1 and 3 only
- B 2 and 4 only
- C 2, 3 and 4 only
- D 1, 2, 3 and 4

Ans: C

27.

Which types of RNA are present in prokaryotic cells and in eukaryotic cells?

	mRNA	rRNA	tRNA	
A	✓	✓	✓	key
B	✓	✓	x	✓ = present
C	x	✓	✓	x = not present
D	x	✓	x	

Ans: A

28.

Plant cells are stained and then seen with a simple light microscope using daylight as the only light source.

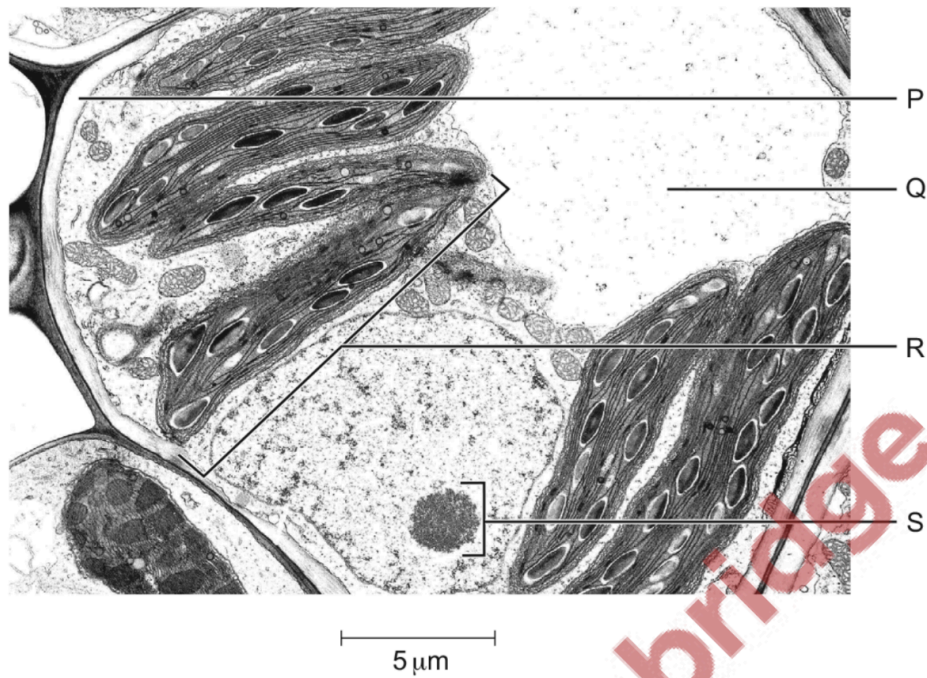
Which cell structures are clearly visible at a magnification of $\times 400$?

- A chloroplast grana
- B lysosomes
- C nucleoli
- D ribosomes

Ans: C

29.

The electron micrograph shows part of a plant cell.



Which combination correctly identifies the labelled cell structures?

	P	Q	R	S
A	cell surface membrane	cytoplasm	mitochondrion	nucleus
B	cell surface membrane	vacuole	chloroplast	nucleus
C	cell wall	cytoplasm	mitochondrion	nucleolus
D	cell wall	vacuole	chloroplast	nucleolus

Ans: D