

30 Why are lymphocytes the only cells that produce antibody proteins?

- A** Lymphocytes express all the genes in the nucleus.
- B** Lymphocytes have twice as many genes as other cells.
- C** Other cells do **not** have the genes for antibodies.
- D** The genes for antibodies are only expressed in lymphocytes.

31 During protein synthesis, what is the function of the ribosome?

- A** It assembles amino acids in a chain.
- B** It carries a copy of a gene to the cytoplasm.
- C** It contains the code for the synthesis of a protein.
- D** It determines the order of bases in the protein.

- 6 Fig. 6.1 is a diagram of a cell that shows how DNA is involved in protein synthesis.

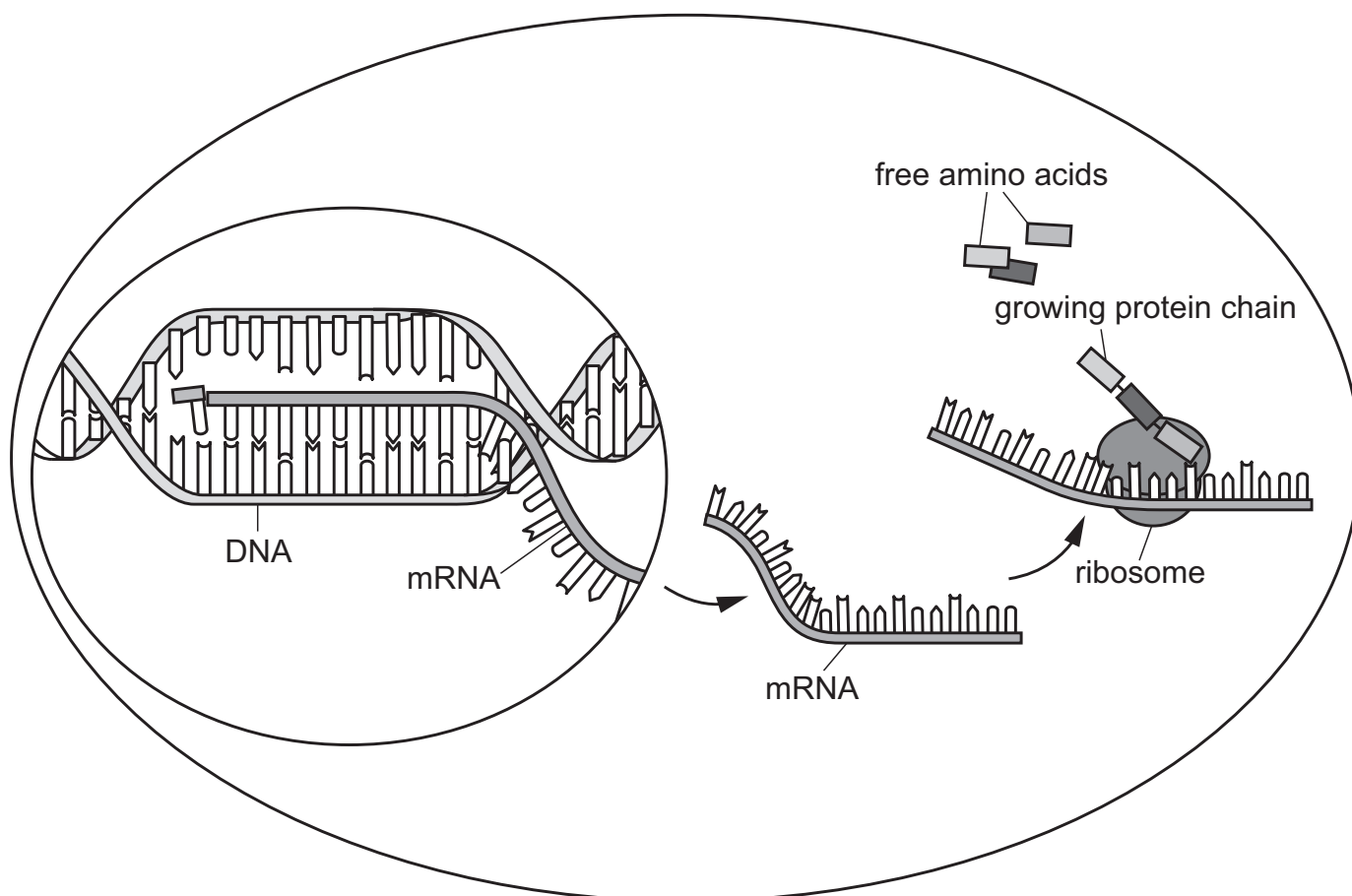


Fig. 6.1

- (a) State the name of the part of the cell that contains DNA.

..... [1]

- (b) DNA controls cell function by controlling the production of proteins.

State the name of **one** type of protein.

..... [1]

- (c) Using Fig. 6.1, explain how mRNA is involved in protein synthesis.

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..... [3]

- 4** In a DNA molecule, bonds between pairs of bases hold two strands together. High temperatures can break these bonds to form two single strands of DNA.

The base pair C and G is held together more strongly than the base pair A and T.

Two DNA molecules containing the same number of bases were studied.

- In DNA molecule 1, 20% of bases are T.
- In DNA molecule 2, 20% of bases are C.

Which DNA molecule would require the lowest temperature to break into single strands?

- A** DNA molecule 1, because there are more A bases present.
- B** DNA molecule 1, because there are more G bases present.
- C** DNA molecule 2, because there are more A bases present.
- D** DNA molecule 2, because there are more G bases present.

- 5 (a) Organisms can be classified by their features and by studying the sequence of bases in their DNA.

Fig. 5.1 is a diagram showing the evolutionary relationships between some different groups of organisms.

Each branch shows the point at which organisms developed new features that classify them as a new group.

The point where the branch starts also indicates a common ancestor shared by the new groups.

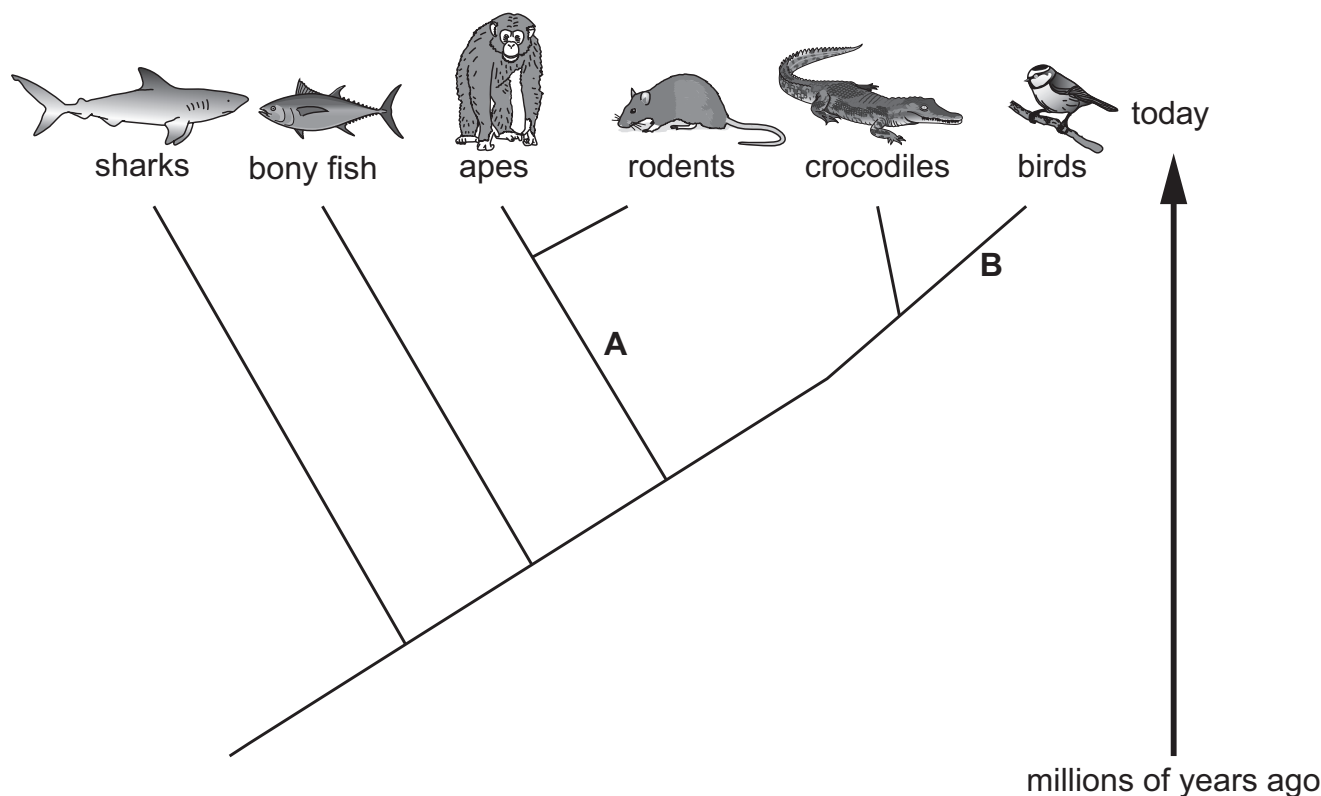


Fig. 5.1

- (i) Suggest which visible features have developed at **A** and **B** in Fig. 5.1.

A

B

[2]

- (ii) Identify the names of the **two** groups that share the most recent common ancestor in Fig. 5.1.

..... and [1]

- (iii) Suggest the groups with the most similar and least similar DNA base sequences to crocodiles in Fig. 5.1.

most similar

least similar

(b) Describe the structure of a DNA molecule.

[4]

(c) Outline how the base sequences in DNA control cell function.

[3]

[Total: 12]

29 Which term is defined as a length of DNA that codes for a protein?

- A amino acid
- B chromosome
- C gene
- D mutation