

1 Proteins and nucleic acids – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)
Proteins	蛋白质	_____
amino acids	氨基酸	_____
peptide bonds	肽键	_____
denature	变性	_____
Nucleic acids	核酸	_____
nucleotides	核苷酸	_____

Recall

In Part A you met the idea that big biological molecules are polymers of small units. Two of them run all of life:

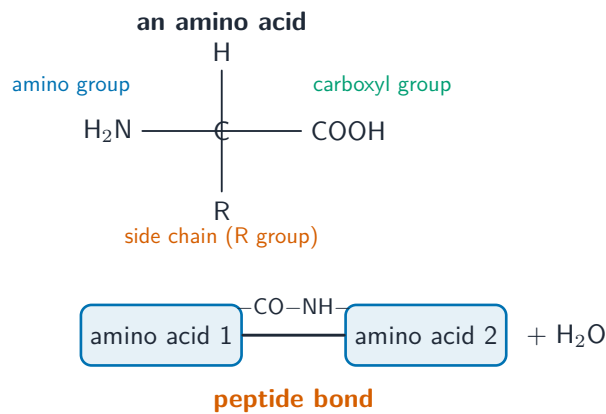
- **Proteins** do most of the work in cells (enzymes, muscle, structure).
- **DNA** carries the genetic instructions.

Each idea has a short worked example before the Practice.

New ideas

■ 1 Proteins

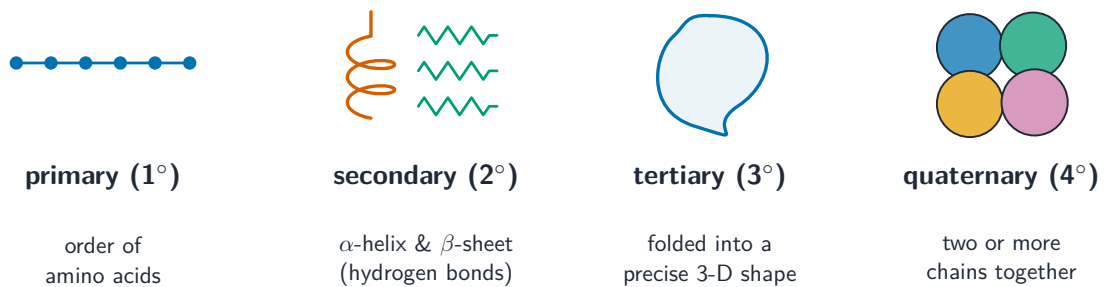
Proteins 蛋白质 are long chains of **amino acids** 氨基酸 joined by **peptide bonds** 肽键. There are 20 different amino acids, so a huge variety of proteins is possible.



condensation removes one water for each peptide bond

■ 2 Shape decides function

A protein chain folds into a specific 3-D shape, and **its shape decides its job** – as an enzyme, a transporter, or a structural part.



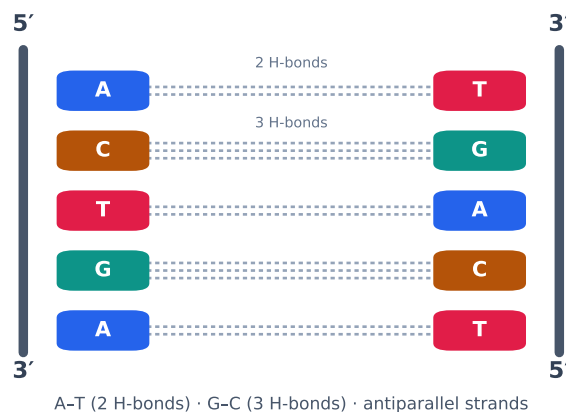
Heat or a change in pH can **denature** 变性 a protein – unfold it – which stops it working.

■ 3 Nucleic acids

Nucleic acids 核酸 (DNA and RNA) store and carry genetic information. They are built from units called **nucleotides** 核苷酸, each a sugar, a phosphate, and a base.

■ 4 DNA base pairing

DNA is two strands held together by pairing of the bases: A pairs with T, and C pairs with G.



complementary pairing: A with T, G with C · strands run antiparallel (5' ↔ 3')

Watch out: a protein's job depends completely on its **shape**. If heat or acid denatures (unfolds) it, the protein stops working – which is why high fever or the wrong pH is dangerous for enzymes.

Practice

Try these in order. The methods are all above.

2.1 State the small units that make up a protein, and the bond that joins them. [2]

2.2 Explain why a protein's shape is so important. [2]

2.3 State what “denature” means and give one thing that can cause it. [2]

2.4 Name the two nucleic acids and state what they do. [2]

2.5 In DNA, state which base pairs with (a) A, (b) C.

[2]