

6 DNA and making proteins – Part 1

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)		
double helix	双螺旋	_____	_____	_____
complementary base pairing	互补配对	_____	_____	_____
semiconservative replication	半保留复制	_____	_____	_____
Transcription	转录	_____	_____	_____
Translation	翻译	_____	_____	_____
ribosome	核糖体	_____	_____	_____
codons	密码子	_____	_____	_____

Recall

You already know the basics of DNA:

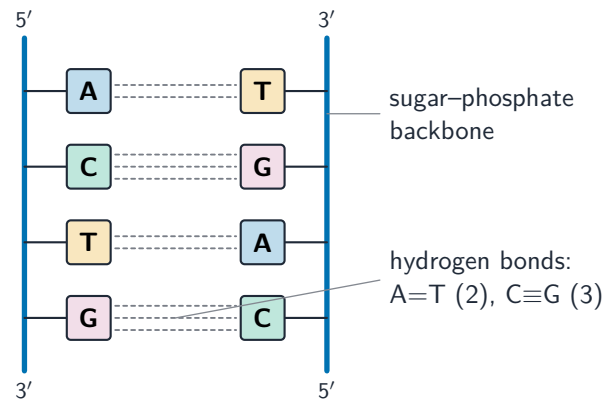
- DNA carries the genetic instructions, in a shape called the **double helix**.
- Its bases pair in a fixed way: A with T, and C with G.
- DNA codes for proteins.

This sheet lines up how a cell reads DNA to build proteins. Each idea has a short worked example.

New ideas

■ 1 DNA structure

DNA is a **double helix** 双螺旋 of two strands. The bases pair by rule – A with T, C with G – called **complementary base pairing** 互补配对. So one strand tells you the other.



the two strands run in opposite directions (antiparallel)

■ 2 DNA replication

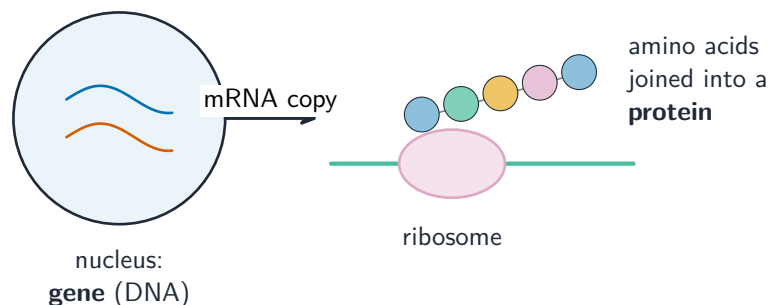
Before a cell divides, DNA is copied by **semiconservative replication** 半保留复制: the helix unwinds and each old strand acts as a template for a new one, so each new helix has one old and one new strand.

■ 3 Transcription

Transcription 转录 copies a gene from DNA into a messenger molecule, mRNA. Note that RNA uses the base U (uracil) in place of T, and is single-stranded.

■ 4 Translation

Translation 翻译 builds a protein from the mRNA at the **ribosome** 核糖体. The mRNA is read in three-base groups called **codons** 密码子, each choosing one amino acid. The overall flow is the “central dogma”: DNA → RNA → protein.



Watch out: RNA is **single-stranded** and uses **U** (uracil) instead of the T found in DNA. Don't carry the DNA rules straight over to RNA.

Practice

Try these in order. The methods are all above.

2.1 In DNA, state which base pairs with (a) A, (b) G. [2]

2.2 A DNA strand reads A–T–C–G. Write the sequence of the complementary strand. [2]

2.3 State what happens during transcription. [2]

2.4 State what a codon is and what it codes for. [2]

2.5 State two ways RNA differs from DNA. [2]
