

The Genetic Code

The three-dimensional configuration of DNA looks like a twisted ladder or spiral staircase, with A–T and G–C base pairs providing the rungs or steps. Hydrogen bonds form between the correct base pairs: A to T, T to A, C to G, and G to C.

RNA has the base *uracil*, instead of thymine. The uracil bases hydrogen-bond with the adenine on the DNA strand, as in the following base sequence.

DNA strand: C C C C A C C C T A C G G T G
 RNA strand: G G G G U G G G A U G C C A C

Decoding RNA sequences to their corresponding amino acid sequences, as shown below. The triplets UAA, UAG, UGA, and AUG signal the end of the gene and the start of the next gene.

RNA strand: GGG GUG GGA UGC CAC
 amino acid: glycine valine glycine cysteine histidine

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First base	Second base				Third base		
	U	C	A	G			
U	UUU UUC Phenylalanine	UCU UCC Serine	UAU UAC Tyrosine	UGU UGC Cysteine	U C		
	UUA UUG Leucine	UCA UCG	UAA UAG Stop	UGA—Stop UGG—Tryptophan	A G		
	C	CUU CUC CUA CUG Leucine	CCU CCC CCA CCG Proline	CAU CAC Histidine	CGU CGC CGA CGG Arginine	U C A G	
		A	AUU AUC AUA AUG—Start Isoleucine	ACU ACC ACA ACG Threonine	AAU AAC Asparagine	AGU AGC Serine	U C
G			GUU GUC GUA GUG Valine	GCU GCC GCA GCG Alanine	GAU GAC Aspartic acid	GGU GGC GGA Glycine	U C A
					GAA GAG Glutamic acid	AGG Arginine	A G
					AGA Arginine	A	
				AGG Arginine	G		