

The Genetic Codon Chart®

	U	C	A	G
U	UUU → Phe F (46) UUC → Phe F (54) UUA → Leu L (41) UUG → Leu L (33)	UCU → Ser S (19) UCC → Ser S (22) UCA → Ser S (14) UUG → Ser S (5)	UAU → Tyr Y (54) UAC → Tyr Y (54) UUA → Stop (34) UAG → Stop (25)	UGU → Cys C (46) UGC → Cys C (54) UGA → Stop (34) UGG → Trp W (54)
C	CUU → Leu L (33) CUC → Leu L (26) CUA → Leu L (7) CUG → Leu L (46)	CCU → Pro P (26) CCC → Pro P (18) CCA → Pro P (28) CCG → Pro P (11)	CAU → His H (42) CAC → His H (38) CAA → Gln Q (27) CAG → Gln Q (23)	CGU → Arg R (46) CGC → Arg R (54) CGA → Arg R (34) CGG → Arg R (26)
A	AUU → Ile I (36) AUC → Ile I (47) AUA → Ile I (12) AUG → Met M (24)	ACU → Thr T (25) ACC → Thr T (36) ACA → Thr T (28) ACG → Thr T (11)	AAU → Asn N (47) AAC → Asn N (53) AAA → Lys K (58) AAG → Lys K (18)	AGU → Ser S (53) AGC → Ser S (24) AGA → Arg R (34) AGG → Arg R (26)
G	GUU → Val V (18) GUC → Val V (24) GUA → Val V (53) GUG → Val V (46)	GCU → Ala A (27) GCC → Ala A (46) GCA → Ala A (28) GCG → Ala A (11)	GAA → Asp D (46) GAC → Asp D (54) GAA → Asp D (34) GAG → Asp D (26)	GGU → Gly G (46) GGC → Gly G (54) GGA → Gly G (34) GGG → Gly G (26)

Amino Acid Properties
 Translation Start Codon: Translation Stop Codon:
 Hydrophobic / NonPolar: Hydrophilic / Polar: Positive Charge: Negative Charge: Cysteine: Sulfur: Aromatic:

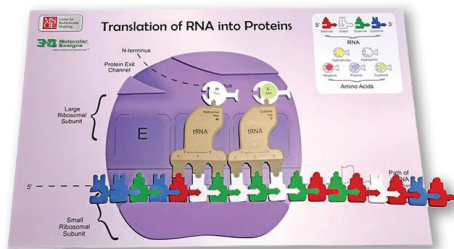
Decoding Messenger RNA

For Use with 3D Molecular Designs' **Genetic Codon Chart**



Proteins are made of unique sequences of **amino acids**. When building a protein, **DNA** is **transcribed** into **messenger RNA (mRNA)**, which is then **translated** into amino acids one **codon** (three mRNA bases) at a time.

Below is the **mRNA** sequence used in 3D Molecular Designs' **Flow of Genetic Information Kit®**. Using the codon chart to guide your work, complete the steps below:



1. Mark the **start codon** in the mRNA sequence
2. Underline each **codon** in the sequence
3. Translate the sequence into **amino acids**
4. Identify the **chemical properties** of each amino acid (see codon chart for recommended color scheme)
5. Change one **nucleotide** in a single codon and predict whether the mutation is **silent**, **missense**, or **nonsense**

Messenger RNA

CGCAUGUGUGAGAUACA UUGGCCAAGACAC

Amino Acid Sequence

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