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# Transcribe and Translate a Gene

## Transcription and Translation

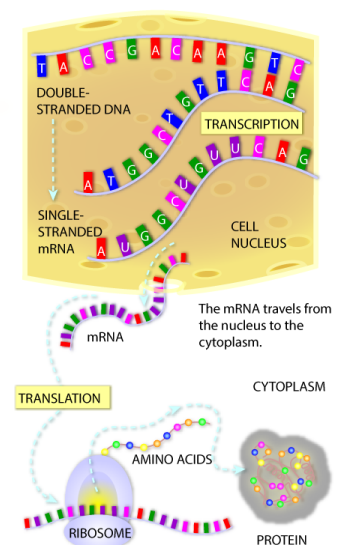
The DNA that makes up the human genome can be subdivided into information bytes called genes. Each gene encodes a unique protein that performs a specialized function in the cell. The human genome contains about 21,000 genes.

Cells use the two-step process of transcription and translation to read each gene and produce the string of amino acids that makes up a protein. The basic rules for translating a gene into a protein are laid out in the Universal Genetic Code.

For an overview of transcription and translation, look over the diagram on the right. Then try it out yourself in the activity above!

**TRANSCRIPTION:** In the nucleus, the cell's machinery copies the gene sequence into messenger RNA (mRNA), a molecule that is similar to DNA. Like DNA, mRNA has four nucleotide bases - but in mRNA, the base uracil (U) replaces thymine (T).

**TRANSLATION:** The protein-making machinery, called the ribosome, reads the mRNA sequence and translates it into the amino acid sequence of the protein. The ribosome starts at the sequence AUG, then reads three nucleotides at a time. Each three-nucleotide codon specifies a particular amino acid. The "stop" codons (UAA, UAG and UGA) tell the ribosome that the protein is complete.



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