

Glossary for Myriad

DNA– A double helix of two chains of nucleotides. There are four types of nucleotides: A, T, C, and G.

DNA sequence – A representation of DNA by listing the chain of nucleotides on one of the two chains of nucleotides.

Gene – A DNA sequence that encodes a functional protein.

Isolated DNA – A DNA sequence (e.g., two nucleotides to thousands nucleotides) taken out of an organism.

Protein/polypeptide – A string of amino acids that have complicated 3-D structures. There are twenty types of amino acids.

Codon – A tri-nucleotide DNA unit (i.e., sets of three nucleotides) that determines the type of amino acids in the string of amino acids that make the protein. In the table below, if part of the DNA sequence reads “GCA” as a codon then an Ala (short for Alanine) is added to the string; if the next part of the DNA sequence reads “AAC” as a codon then an Asn (short for Asparagine) is added to the Ala.

The DNA sequence GACTGTGCAATC which has 12 nucleotides and four codons yields the following string of amino acids: Asp-Cys-Ala-Ile

Multiple codons can give rise to the same amino acid. For example, four different codons can yield an Ala and six different codons can yield an Arg.

Codons produce the following amino acids

DNA Genetic Codon	Amino Acid
GCA; GCC; GCG; GCT	Alanine (Ala)
AGA; AGG; CGA; CGC; CGG; CGT	Arginine (Arg)
AAC; AAT	Asparagine (Asn)
GAC; GAT	Aspartic acid (Asp)
TGC; TGT	Cysteine (Cys)
CAA; CAG	Glutamine (Gln)
GAA; GAG	Glutamic acid (Glu)
GGA; GGC; GGG; GGT	Glycine (Gly)
CAC; CAT	Histidine (His)
ATA; ATC; ATT	Isoleucine (Ile)
CTA; CTC; CTG; CTT; TTA; TTG	Leucine (Leu)
AAA; AAG	Lysine (Lys)
ATG	Methionine (Met)
TTC; TTT	Phenylalanine (Phe)
CCA; CCC; CCG; CCT	Proline (Pro)
AGC; AGT; TCA; TCC; TCG; TCT	Serine (Ser)
ACA; ACC; ACG; ACT	Threonine (Thr)
TGG	Tryptophan (Try)
TAC; TAT	Tyrosine (Tyr)
GTA; GTC; GTG; GTT	Valine (Val)

cDNA

The DNA sequence of most genes in Eukaryotic cells includes portions of the DNA sequence that do not code for the protein. The portions of the DNA sequence of the gene that code for amino acids of the protein are **exons**. The portions of the DNA sequence of the gene that do not code for the protein are **introns**.

cDNA is a human-made DNA sequence that includes only exons. cDNA is not found in nature.