

Triplet nature

A triplet code could make a genetic code for 64 different combinations ($4 \times 4 \times 4$) genetic code and provide plenty of information in the DNA molecule to specify the placement of all 20 amino acids. When experiments were performed to crack the genetic code it was found to be a code that was triplet. These three letter codes of nucleotides (AUG, AAA, etc.) are called codons.

Degeneracy

The code is degenerate which means that the same amino acid is coded by more than one base triplet. For example, the three amino acids arginine, alanine and leucine each have six synonymous codons.

Nonoverlapping

The genetic code is non overlapping i.e the adjacent codons do not overlap. A nonoverlapping code means that the same letter is not used for two different codons. In other words, no single base can take part in the formation of more than one codon.

Commaless

There is no signal to indicate the end of one codon and the beginning of the next. The genetic code is comma-free.

Non-ambiguity

A particular codon will always code for the same amino acid. While the same amino acid can be coded by more than one codon (the code is degenerate), the same codon shall not code for two or more different amino acids (non-ambiguous).

Universality

Although the code is based on work conducted on the bacterium *Escherichia coli* but it is valid for other organisms. This important characteristic of the genetic code is called its universality. It means that the same sequences of 3 bases encode the same amino acids in all life forms from simple microorganisms to complex, multicelled organisms such as human beings.

Polarity

The genetic code has polarity, that is, the code is always read in a fixed direction, i.e., in the $5' \rightarrow 3'$ direction.

Chain Initiation Codons

The triplets AUG and GUG play double roles in *E. coli*. When they occur in between the two ends of a cistron (intermediate position), they code for the amino acids methionine and valine, respectively in an intermediate position in the protein molecule.

Chain Termination Codons

The 3 triplets UAA, UAG, UGA do not code for any amino acid. They were originally described as non-sense codons, as against the remaining 61 codons, which are termed as sense codons.

