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Editorial Note on Genetic Code

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Editorial

The genetic code is the set of rules used by living cells to translate information encoded within genetic material such as DNA or mRNA sequences of nucleotide triplets or codons into proteins. Translation is accomplished by the ribosome which links proteinogenic amino acids in an order specified by messenger RNA (mRNA), using transfer RNA (tRNA) molecules to carry amino acids and to read the mRNA three nucleotides at a time.

The genetic code is a key part of the history of life, according to one version of which self-replicating RNA molecules preceded life as we know it. This is the RNA world hypothesis. Under this hypothesis, any model for the emergence of the genetic code is intimately related to a model of the transfer from ribozymes (RNA enzymes) to proteins as the principal enzymes in cells. In line with the RNA world hypothesis, transfer RNA molecules appear to have evolved before modern aminoacyl-tRNA synthetases so the latter cannot be a part of the explanation of its patterns.

A, C, G, and T are the "letters" of the DNA code. They stand for the chemicals adenine (A), cytosine (C), guanine (G), and thymine (T), respectively which make up the nucleotide bases of DNA. Each gene's code combines the four chemicals in various ways to spell out three-letter "words" which specify which amino acid is needed at every step in making a protein.

Genetic code is the term we use for the way that the four bases of DNA the A, C, G, and T are strung together in a way that the cellular machinery, the ribosome, can read them and turn them into a protein. In the genetic code each three nucleotides in a row count as a triplet and code for a single amino acid. So each sequence of three codes for an amino acid and proteins are made up of hundreds of amino acids. So the code which would make one protein could have hundreds, sometimes even thousands of triplets contained in it.

The genetic code is described as degenerate or redundant because a single amino acid may be coded for by more than one codon. It is also important to note that the genetic code does not overlap which means each nucleotide is a part of only one codon. A single nucleotide cannot be part of two adjacent codons.

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