APPENDIX 4

AMINO ACIDS IN PROTEIN COMPOSITION AND THE GENETIC CODE

Amino acid	Abbreviation	Amino acid	Abbreviation	Amino acid	Abbreviation
Alanine	Ala	Glycine	Gly	Proline	Pro
Arginine	Arg	Histidine	His	Serine	Ser
Asparagine	Asn	Isoleucine	Ile	Threonine	Thr
Aspartic acid	Asp	Leucine	Leu	Tryptophan	Trp
Cysteine	Cys	Lysine	Lys	Tyrosine	Tyr
Glutamic acid	Glu	Methionine	Met	Valine	Val
Glutamine	Gln	Phenylalanine	Phe		

THE GENETIC CODE

The genetic code indicates how each nucleotide triplet (codon) carried by the mRNA should be translated during protein synthesis. In the example below, the amino acid trytophan (Trp) is encoded by the codon UGG, while the amino acid phenylalanine (Phe) is encoded by the codon UUU.

The codon AUG not only encodes the amino acid methionine (Met) but also acts as the start codon, initiating the protein synthesis. Codons UAA, UAG and UGA (stop codons) signal the end of the protein synthesis.

GENETIC CODE

First base	Second base: U	Second base: C	Second base: A	Second base: G	Third base
U	UUU Phe	UCU Ser	UAU Tyr	UGU Cys	U
	UUC Phe	UCC Ser	UAC Tyr	UGC Cys	C
	UUA Leu	UCA Ser	UAA Stop	UGA Stop	A
	UUG Leu	UCG Ser	UAG Stop	UGG Trp	G
C	CUU Leu	CCU Pro	CAU His	CGU Arg	U
	CUC Leu	CCC Pro	CAC His	CGC Arg	C
	CUA Leu	CCA Pro	CAA Gln	CGA Arg	A
	CUG Leu	CCG Pro	CAG Gln	CGG Arg	G
A	AUU Ile	ACU Thr	AAU Asn	AGU Ser	U
	AUC Ile	ACC Thr	AAC Asn	AGC Ser	C
	AUA Ile	ACA Thr	AAA Lys	AGA Arg	A
	AUG Start	ACG Thr	AAG Lys	AGG Arg	G
G	GUU Val	GCU Ala	GAU Asp	GGU Gly	U
	GUC Val	GCC Ala	GAC Asp	GGC Gly	C
	GUA Val	GCA Ala	GAA Glu	GGA Gly	A
	GUG Val	GCG Ala	GAG Glu	GGG Gly	G

EXAMPLE OF TRANSLATION