Nomenclature and Symbolism for Amino Acids and Peptides as described by IUPAC[1]

1-letter	3-letter	Amino Acid Name
A	Ala	Alanine
– B	Asx	Aspartic Acid or Asparagine
C	Cys	Cysteine
D	Asp	Aspartic Acid
E	Glu	Glutamic Acid
F	Phe	Phenylalanine
G	Gly	Glycine
H	His	Histidine
I	Ile	Isoleucine
– J	Xle	Leucine or Isoleucine
K	Lys	Lysine
L	Leu	Leucine
M	Met	Methionine

1-letter	3-letter	Amino Acid Name
N	Asn	Asparagine
O	Pyl	Pyrrolysine
P	Pro	Proline
Q	Gln	Glutamine
R	Arg	Arginine
S	Ser	Serine
T	Thr	Threonine
U	Sec	Selenocysteine
V	Val	Valine
W	Trp	Tryptophan
X	Xaa	Unknown or 'Other' Amino Acid
Y	Tyr	Tyrosine
– Z	Glx	Glutamic Acid or Glutamine

Keep Away From Children

Do not ingest

Notes on the Choice of Symbols

Initial letters of the names of the amino acids were chosen where there was no ambiguity. There are six such cases: cysteine, histidine. isoleucine, methionine, serine and valine. All the other amino acids share the initial letters A, G, L, P or T, so arbitrary assignments were made. These letters were assigned to the most frequently occurring and structurally most simple of the amino acids with these initials, alanine (A), glycine (G), leucine (L), proline (P) and threonine (T).

Other assignments were made on the basis of associations that might be helpful in remembering the code, e.g. the phonetic associations of F for phenylalanine and R for arginine. For tryptophan the double ring of the molecule is associated with the bulky letter W. The letters N and Q were assigned to asparagine and glutamine respectively; D and E to aspartic and glutamic acids respectively. K and Y were chosen for the two remaining amino acids, lysine and tyrosine, because, of the few remaining letters, they were close alphabetically to the initial letters of the names. U and O were avoided because U is easily confused with V in handwritten material, and O with G, Q, C and D in imperfect computer print-outs, and also with zero. J was avoided because it is absent from several languages.

Two other symbols are often necessary in partly determined sequences, so B was assigned to aspartic acid or asparagine when these have not been distinguished; Z was similarly assigned to glutamic acid or glutamine. X means that the identity of an amino acid is undetermined, or that the amino acid is atypical.[2]

Pyrrolysine is a naturally occurring, genetically coded amino acid used by some methanogenic archaea in enzymes that are part of their methane-producing metabolism. Its systematic name is N6-[(2R,3R)-3-methyl-3,4-dihydro-2H-pyrrol-2-ylcarbonyl]-L-lysine. The joint nomenclature committee of the IUPAC/IUBMB has officially recommended the three-letter symbol Pyl and the one-letter symbol O for pyrrolysine.[3]

Selenocysteine is present in several enzymes (for example glutathione peroxidases, glycine reductases, some hydrogenases, etc.). Unlike other amino acids it is not coded for directly in the gene, but rather in an insertion element immediately after the stop codon. The resulting mRNA sequence mates with a specialized Sslenocysteine tRNA during translation. IUPAC/IUBMB has officially recommended the three-letter symbol Sec and the one-letter symbol U for selenocysteine.

[1] IUPAC-IUB Joint Commission on Biochemical Nomenclature. Nomenclature and Symbolism for Amino Acids and Peptides. Eur. J. Biochem. 138:9-37(1984). IUPAC-IUBMB JCBN Newsletter, 1999 http://www.chem.qmul.ac.uk/iubmb/newsletter/1999/item3.html

[2] International Union Of Pure And Applied Chemistry And International Union Of Biochemistry And Molecular Biology Iupac-iub Joint Commission On Biochemical Nomenclature (Jcbn) Nomenclature And Symbolism For Amino Acids And Peptides (Recommendations 1983) Http://www.chem.qmul.ac.uk/iupac/aminoacid/ World Wide Web Version Prepared By G. P. Moss, Department Of Chemistry, Queen Mary University Of London, Mile End Road, London, E1 4ns, Uk G.P.Moss@qmul.ac.uk

[3] http://en.wikipedia.org/wiki/Pyrrolysine