

# Nomenclature Policy: Abbreviated Designations of Amino Acids

The following rules for nomenclature of the amino acids are based on the Rules of the IUPAC-IUB Commission on Biochemical Nomenclature for designation of amino acids and peptides (1,2) and were adopted by recommendation of the AIN Committee on Nomenclature as the nomenclature of the official journals of the AIN.

## 1. GENERAL CONSIDERATIONS

**1.1** The symbols chosen are derived from the trivial names or chemical names of the amino acids and of chemicals reacting with amino acids and polypeptides. For the sake of clarity, brevity and listing in tables, the symbols have been, wherever possible, restricted to three letters, usually the first letters of the trivial names.

**1.2** The symbols represent not only the names of the compounds but also their structural formulas.

**1.3** The amino acid symbols by themselves represent the amino acids. The use of the symbols to represent the free amino acids is *not* recommended in textual material, but such use may occasionally be desirable in tables, diagrams or figures. Residues of amino acids are represented by addition of hyphens in specific positions.

**1.4** Heteroatoms of amino acid residues (e.g., O<sup>β</sup> and S<sup>β</sup> of serine and cysteine, respectively, N<sup>ε</sup> of lysine, N<sup>α</sup> of glycine, etc.) do not explicitly appear in the symbol; such features are understood to be encompassed by the abbreviation.

**1.5** Amino acid symbols denote the L configuration unless otherwise indicated by D or DL appearing before the symbol and separated from it by a hyphen. When it is desired to make the number of amino acid residues appear in a clearer manner, the hyphen between the configurational prefix and the symbol may be omitted (see ref. 1). (Note: the designation of an amino acid residue as DL is inappropriate for compounds having another amino acid residue with an asymmetrical center.)

**1.6** Structural formulas of complicated features may be used along with the abbreviated notation whenever necessary for clarity.

## 2. ABBREVIATIONS FOR AMINO ACIDS

### 2.1 Common Amino Acids

Alanine	Ala	Leucine	Leu
Arginine	Arg	Lysine	Lys
Asparagine <sup>1</sup>	Asn <sup>1</sup>	Methionine	Met
Aspartic acid	Asp	Ornithine	Orn
Cysteine	Cys	Phenylalanine	Phe
Cystine	Cys-Cys <sup>2</sup>	Proline	Pro
Glutamic acid	Glu	Serine	Ser
Glutamine <sup>1</sup>	Gln <sup>1</sup>	Threonine	Thr
Glycine	Gly	Tryptophan	Trp
Histidine	His	Tyrosine	Tyr
Isoleucine	Ile	Valine	Val

**2.2 Less Common Amino Acids**—Abbreviations for less common amino acids should be defined in each publication in which they appear. The following principles and notations are recommended:

#### 2.2.1 Hydroxyamino Acids

Hydroxylysine	Hyl
3-Hydroxyproline	3Hyp
4-Hydroxyproline	4Hyp

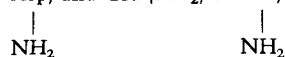
#### 2.2.2 *allo*-Amino Acids

<i>allo</i> -Isoleucine	<i>alle</i>
<i>allo</i> -Hydroxylysine	<i>aHyl</i>

## REFERENCES

1. IUPAC-IUB Commission on Biochemical Nomenclature (1972) Abbreviated nomenclature of synthetic polypeptides (polymerized amino acids). Revised recommendations 1971. *Biochemistry* 11: 942-944.
2. IUPAC-IUB Commission on Biochemical Nomenclature (JCBN) (1984) Nomenclature and Symbolism of Amino Acids and Peptides. Recommendations 1983. *Eur. J. Biochem.* 138: 9-37.

<sup>1</sup>Asparagine and glutamine may also be denoted as Asp (NH<sub>2</sub>) or Asp, and Glu (NH<sub>2</sub>) or Glu,



<sup>2</sup>Cystine does not appear in 2.1 (ref. 1). We propose Cys-Cys as consistent with 2.1 but this abbreviation should not be used to denote structure.