

TABLE 2.1 The 20 natural amino acids and chemical descriptions of their side chains.

Group	Full Name	Three-Letter Name	One-Letter Name	Side Chain Group
No side chain	Glycine	Gly	G	—
Nonpolar	Alanine	Ala	A	Methane
	Valine	Val	V	Propane
	Leucine	Leu	L	2-Methyl-propane
	Isoleucine	Ile	I	Butane
	Proline	Pro	P	Pyrrolidine
	Methionine	Met	M	(Methyl-sulfanyl)ethane
Polar-uncharged	Serine	Ser	S	Methanol
	Threonine	Thr	T	Ethanol
	Cysteine	Cys	C	Methanethiol
	Asparagine	Asn	N	Acetamide
	Glutamine	Gln	Q	Propanamide
Electrically charged	Glutamate	Glu	E	Propanoate
	Aspartate	Asp	D	Acetate
	Lysine	Lys	K	Butan-1-amine
	Arginine	Arg	R	1-Propyl-guanidine
	Histidine	His	H	4-Methyl-1H-imidazole
Aromatic	Phenylalanine	Phe	F	Methyl-benzene
	Tyrosine	Tyr	Y	4-Methyl-phenol
	Tryptophan	Trp	W	3-Methyl-1H-indole