



Amino Acid Table

Chemical name	3-letter code	1-letter code	Molecular formula	Molecular weight	pKa			Isoelectric point (pI)	Property	Codons
					α -COOH	α -NH ₃ ⁺	side chain			
Alanine	Ala	A	C ₃ H ₇ N ₁ O ₂	89,09	2,35	9,87		6,01	non-polar, uncharged	GCU, GCC, GCA, GCG
Arginine	Arg	R	C ₆ H ₁₄ N ₄ O ₂	174,2	1,82	8,99	12,48	10,76	basic	CGU, CGC, CGA, CGG, AGA, AGG
Asparagine	Asn	N	C ₄ H ₈ N ₂ O ₃	132,12	2,14	8,72		5,41	polar, uncharged	AAU, AAC
Aspartic acid	Asp	D	C ₄ H ₇ N ₁ O ₄	133,1	1,99	9,90	3,65	2,85	acidic	GAU, GAC
Cysteine	Cys	C	C ₃ H ₇ N ₁ O ₂ S ₁	121,16	1,92	10,70	8,18	5,05	polar, uncharged	UGU, UGC
Glutamic acid	Glu	E	C ₅ H ₉ N ₁ O ₄	147,13	2,10	9,47	4,25	3,15	acidic	GAA, GAG
Glutamine	Gln	Q	C ₅ H ₁₀ N ₂ O ₃	146,15	2,17	9,13		5,65	polar, uncharged	CAA, CAG
Glycine	Gly	G	C ₂ H ₅ N ₁ O ₂	75,07	2,35	9,78		6,06	polar, uncharged	GGU, GGC, GGA, GGG
Histidine	His	H	C ₆ H ₉ N ₃ O ₂	155,16	1,80	9,33	6,00	7,60	basic	CAU, CAC
Isoleucine	Ile	I	C ₆ H ₁₃ N ₁ O ₂	131,17	2,32	9,76		6,05	non-polar, uncharged	AUU, AUC, AUA
Leucine	Leu	L	C ₆ H ₁₃ N ₁ O ₂	131,17	2,33	9,74		6,01	non-polar, uncharged	UUA, UUG, CUU, CUC, CUA, CUG
Lysine	Lys	K	C ₆ H ₁₄ N ₂ O ₂	146,19	2,16	9,06	10,53	9,60	basic	AAA, AAG
Methionine	Met	M	C ₅ H ₁₁ N ₁ O ₂ S ₁	149,21	2,13	9,28		5,74	non-polar, uncharged	AUG
Phenylalanine	Phe	F	C ₉ H ₁₁ N ₁ O ₂	165,19	2,20	9,31		5,49	non-polar, uncharged	UUU, UUC
Proline	Pro	P	C ₅ H ₉ N ₁ O ₂	115,13	1,95	10,64		6,30	non-polar, uncharged	CCU, CCC, CCA, CCG
Pyrrolysine	Pyl	O	C ₁₂ H ₂₁ N ₃ O ₃	255,31	na	na	na	na	basic	UAG
Selenocysteine	Sec	U	C ₃ H ₇ N ₁ O ₂ Se ₁	168,05	1,91	10,00	5,43	5,47	polar	UGA
Serine	Ser	S	C ₃ H ₇ N ₁ O ₃	105,09	2,21	9,15		5,68	polar, uncharged	UCU, UCC, UCA, UCG, AGU, AGC
Threonine	Thr	T	C ₄ H ₉ N ₁ O ₃	119,12	2,09	9,10		5,60	polar, uncharged	ACU, ACC, ACA, ACG
Tryptophan	Trp	W	C ₁₁ H ₁₂ N ₂ O ₂	204,23	2,46	9,41		5,89	non-polar, uncharged	UGG
Tyrosine	Tyr	Y	C ₉ H ₁₁ N ₁ O ₃	181,19	2,20	9,21	10,07	5,64	polar, uncharged	UAU, UAC
Valine	Val	V	C ₅ H ₁₁ N ₁ O ₂	117,15	2,39	9,74		6,00	non-polar, uncharged	GUU, GUC, GUA, GUG

