

**The masses and compositions of commonly occurring amino acid residues**

Symbols	Name and Composition		Monoisotopic Mass	Average Mass
Ala	A Alanine	$C_3H_5NO$	71.03711	71.0788
Arg	R Arginine	$C_6H_{12}N_4O$	156.10111	156.1876
Asn	N Asparagine	$C_4H_6N_2O_2$	114.04293	114.1039
Asp	D Aspartic Acid	$C_4H_5NO_3$	115.02694	115.0886
Cys	C Cysteine	$C_3H_5NOS$	103.00919	103.1448
Glu	E Glutamic Acid	$C_5H_7NO_3$	129.04259	129.1155
Gln	Q Glutamine	$C_5H_8N_2O_2$	128.05858	128.1308
Gly	G Glycine	$C_2H_3NO$	57.02146	57.0520
His	H Histidine	$C_6H_7N_3O$	137.05891	137.1412
Ile	I Isoleucine	$C_6H_{11}NO$	113.08406	113.1595
Leu	L Leucine	$C_6H_{11}NO$	113.08406	113.1595
Lys	K Lysine	$C_6H_{12}N_2O$	128.09496	128.1742
Met	M Methionine	$C_5H_9NOS$	131.04049	131.1986
Phe	F Phenylalanine	$C_9H_9NO$	147.06841	147.1766
Pro	P Proline	$C_5H_7NO$	97.05276	97.1167
Ser	S Serine	$C_3H_5NO_2$	87.03203	87.0782
Thr	T Threonine	$C_4H_7NO_2$	101.04768	101.1051
Trp	W Tryptophan	$C_{11}H_{10}N_2O$	186.07931	186.2133
Tyr	Y Tyrosine	$C_9H_9NO_2O$	163.06333	163.176
Val	V Valine	$C_5H_9NO$	99.06841	99.1326
Abu	2-Aminobutyric acid	$C_4H_7NO$	85.05276	85.1057
AECys	Aminoethylcysteine	$C_5H_{10}N_2OS$	146.05138	146.2133
Aib	2-Aminoisobutyric acid	$C_4H_7NO$	85.05276	85.1057
Cme	Carboxymethylcysteine	$C_5H_7NO_3S$	161.01466	161.1815
Cys(O <sub>3</sub> H)	Cysteic acid	$C_3H_5NO_4S$	150.99393	151.1430
Dha	Dehydroalanine	$C_3H_3NO$	69.02146	69.0630
Dhb	Dehydroamino-2-butyric acid		83.03711	83.0898
Gla	4-carboxyglutamic acid	$C_4H_5NO$	173.03242	173.1253
Hse	Homoserine	$C_4H_7NO_2$	101.04768	101.1051
Hyl	Hydroxylysine	$C_6H_{12}N_2O_2$	144.08988	144.1736
Hyp	Hydroxyproline	$C_5H_7NO_2$	113.04768	113.1161
Iva	Isovaline	$C_5H_9NO$	99.06841	99.1326
Nlc	Norleucine	$C_6H_{11}NO$	113.08406	113.1595
Orn	Ornithine	$C_5H_{10}N_2O$	114.07931	114.1473
Pip	2-Piperidinecarboxylic acid	$C_6H_9NO$	111.06841	111.1436
Pyr	Pyroglutamic acid	$C_5H_5NO_2$	111.03203	111.1002
Sar	Sarcosine	$C_3H_5NO$	71.03711	71.0788

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