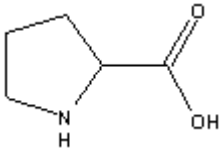
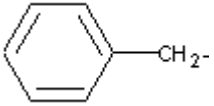
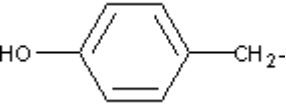
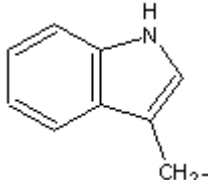
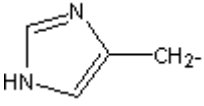
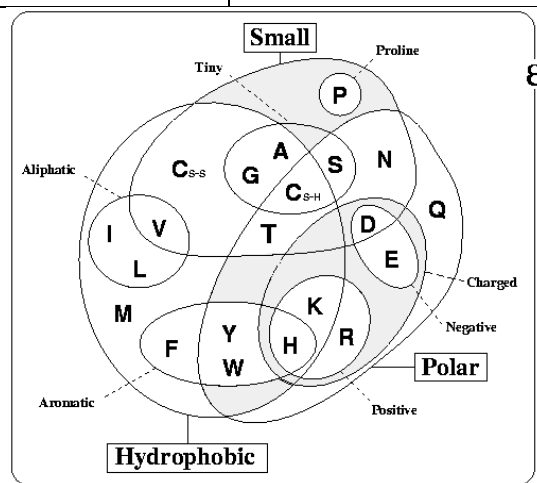


Amino Acid Information – June, 2004 – L. Ellis

(R groups are shown in their neutral state; the entire Proline amino acid is shown)

One letter code	G	A	P
Full name	glycine	alanine	proline
Three letter code	gly	ala	pro
Physical Properties	tiny, small	tiny, small, hydrophobic	small, [rigid]
R group	H-	CH ₃ -	
One letter code	V	I	L
Full name	valine	isoleucine	leucine
Three letter code	val	ile	leu
Physical Properties	small, aliphatic, hydrophobic	aliphatic, hydrophobic	aliphatic, hydrophobic
R group	CH ₃ -CH(CH ₂)-	CH ₃ -CH ₂ -CH(CH ₃)-	(CH ₃) ₂ -CH-CH ₂ -
One letter code	F	Y	W
Full name	phenylalanine	tyrosine	tryptophan
Three letter code	phe	tyr	trp
Physical Properties	aromatic, hydrophobic	aromatic, polar, hydrophobic	aromatic, polar, hydrophobic
R group			
One letter code	D	E	
Full name	aspartate	glutamate	
Three letter code	asp	glu	
Physical Properties	small, polar, charged, negative	polar, charged, negative	
R group	HOOC-CH ₂ -	HOOC-(CH ₂) ₂ -	
One letter code	N	Q	
Full name	asparagine	glutamine	
Three letter code	asn	gln	
Physical Properties	small, polar	polar	
R group	H ₂ N-CO-CH ₂ -	H ₂ N-CO-(CH ₂) ₂ -	

One letter code	K	R	H
Full name	lysine	arginine	histidine
Three letter code	lys	arg	his
Physical Properties	charged, positive, polar, hydrophobic	charged, positive, polar	aromatic, charged, positive, polar, hydrophobic
R group	$\text{H}_2\text{N}-(\text{CH}_2)_4-$	$\text{HN}=\text{C}(\text{NH}_2)-\text{NH}-(\text{CH}_2)_3-$	
One letter code	S	T	
Full name	serine	threonine	
Three letter code	ser	thr	
Physical Properties	tiny, small, polar	small, polar	
R group	$\text{HO}-\text{CH}_2-$	$\text{CH}_3-\text{CH}(\text{OH})-$	
One letter code	C	M	
Full name	cysteine	methionine	
Three letter code	cys	met	
Physical Properties	tiny, small, hydrophobic, polar	hydrophobic	
R group	$\text{HS}-\text{CH}_2-$	$\text{CH}_3-\text{S}-(\text{CH}_2)_2-$	



from <http://www.russell.embl.de/aas/>