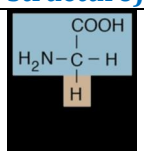
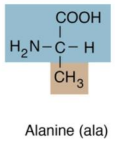
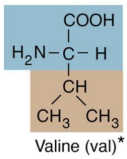
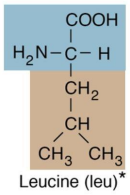
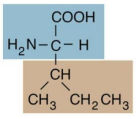
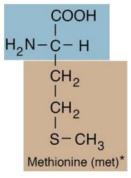
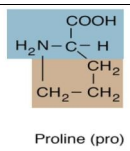
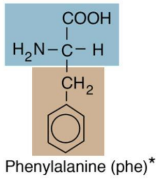
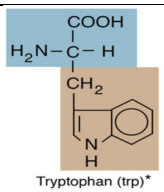
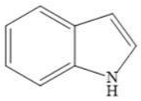
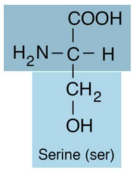
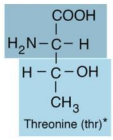
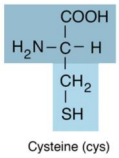
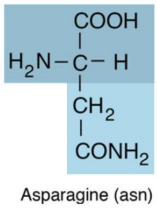
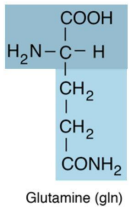
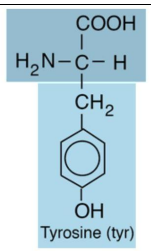
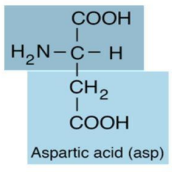
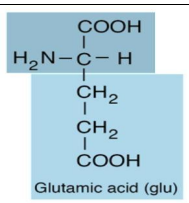
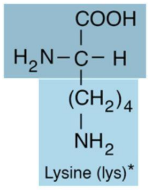
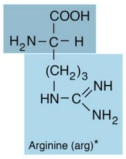
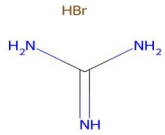
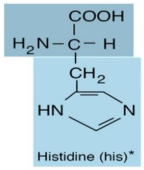
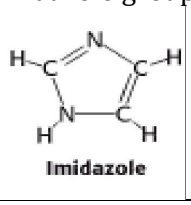
Amino acids summary

Class	AA	Abbr.	R-group (chemical structure)	Key feature	Derivatives and functions
Non polar-hyrophobic	Glycine	Gly		Smallest; the only achiral AA Acetic acid derivative	Glycine itself is an Inhibitory neurotransmitter
	Alanine	Ala	 Alanine (ala)		
	Valine	Val	 Valine (val)*	All are essential amino acids,, and are branched AA	
	Leucine	Leu	 Leucine (leu)*		
	Isoleucine	Ile	 Isoleucine (ile)*		
	Methionine	Met	 Methionine (met)*	Thioether Internal sulfur	SAM molecule is an derivative of it ,,which is a methyl donor
	Proline	Pro	 Proline (pro)	Rigid; the only cyclic AA,, secondary amine	Undergoes hydroxylation to form hydroxyproline , which is important for collagen structure
	Phenylalanine	Phe	 Phenylalanine (phe)*	Aromatic ring	

Amino acids summary

	Tryptophan	Trp		Indole ring 	-Serotonin (neurotransmitter and sedative molecule) -Melatonin(sleep schedule) abundant in infants
Polar, non charged	Serine	Ser		Alanine+OH ,,reactive due hydroxyl group	
	Threonine	Thr		Serine + CH3 Also reactive	
	Cysteine	Cys		Thiol,,sulfhydryl reactive group	
	Asparagine	Asn		Derivative of aspartic acid,, has an amide group	
	Glutamine	Gln		Derivative of glutamic acid,, has an amide group	
	Tyrosine	Tyr		Derivative of phenylalanine Phenylalanine +OH	-Formation of catecholeamines: 1.Dopamine 2.Norepinephrine 3.epinephrine -thyroxine hormone -melanin(eumelanin; dark skin,,phenomelanin; red skin and hair)
Negatively charged	Aspartic Acid	Asp		COOH if ionized aspartate	

Amino acids summary

	Glutamic Acid	Glu		COOH if ionized glutamate	-(GABA), an inhibitory neurotransmitter. relaxing, anti-anxiety and anti-convulsive effects -γ- carboxyglutamate)carboxylation of glutamate in presence of vitamin K „„essential for blood clotting) Formation of MSG (meat tenderizer)
Positively charged	Lysine	Lys		Long R group with trminal primary amine	Undergoes hydroxylation to form hydroxylysine , which is important for collagen structure
	Arginine	Arg		Long R group with guanidinium group 	precursor of nitric oxide (NO)„ which causes Vasodilation (relaxing), inhibition of platelet aggregation, anti-inflammatory
	Histidine	His		Imidazole group 	Precursor of histamine which is a Neurotransmitter causing allergic reactions(eg: asthma) Blocked by antihistamines

[Thorough quiz.....good luck!!]

https://share.gemini.google/MnDzC0jDmGOR

All the info in this table is based on the slides and the lecture of Dr. Mamoun Ahram