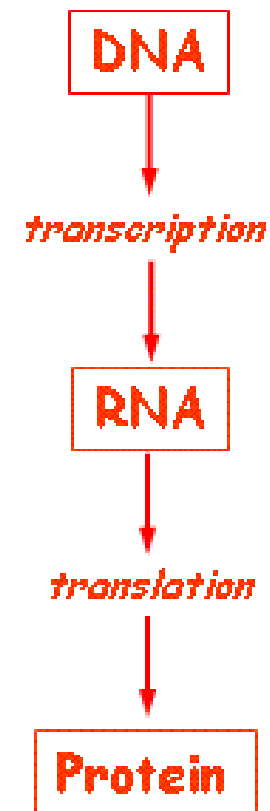
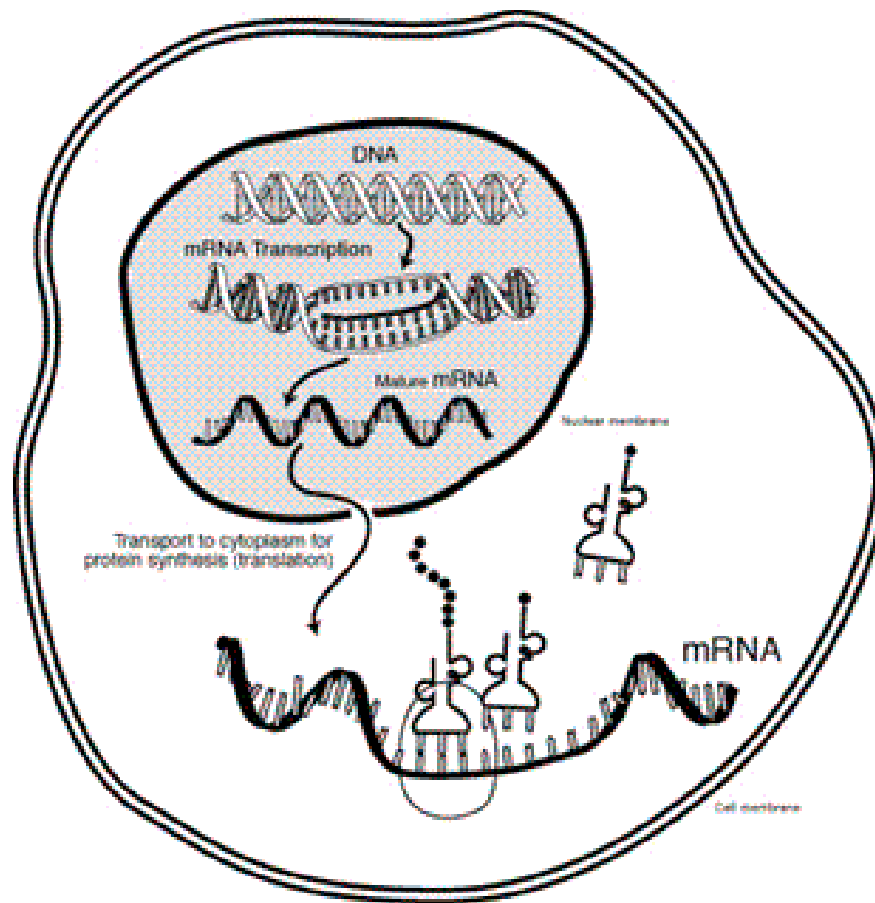


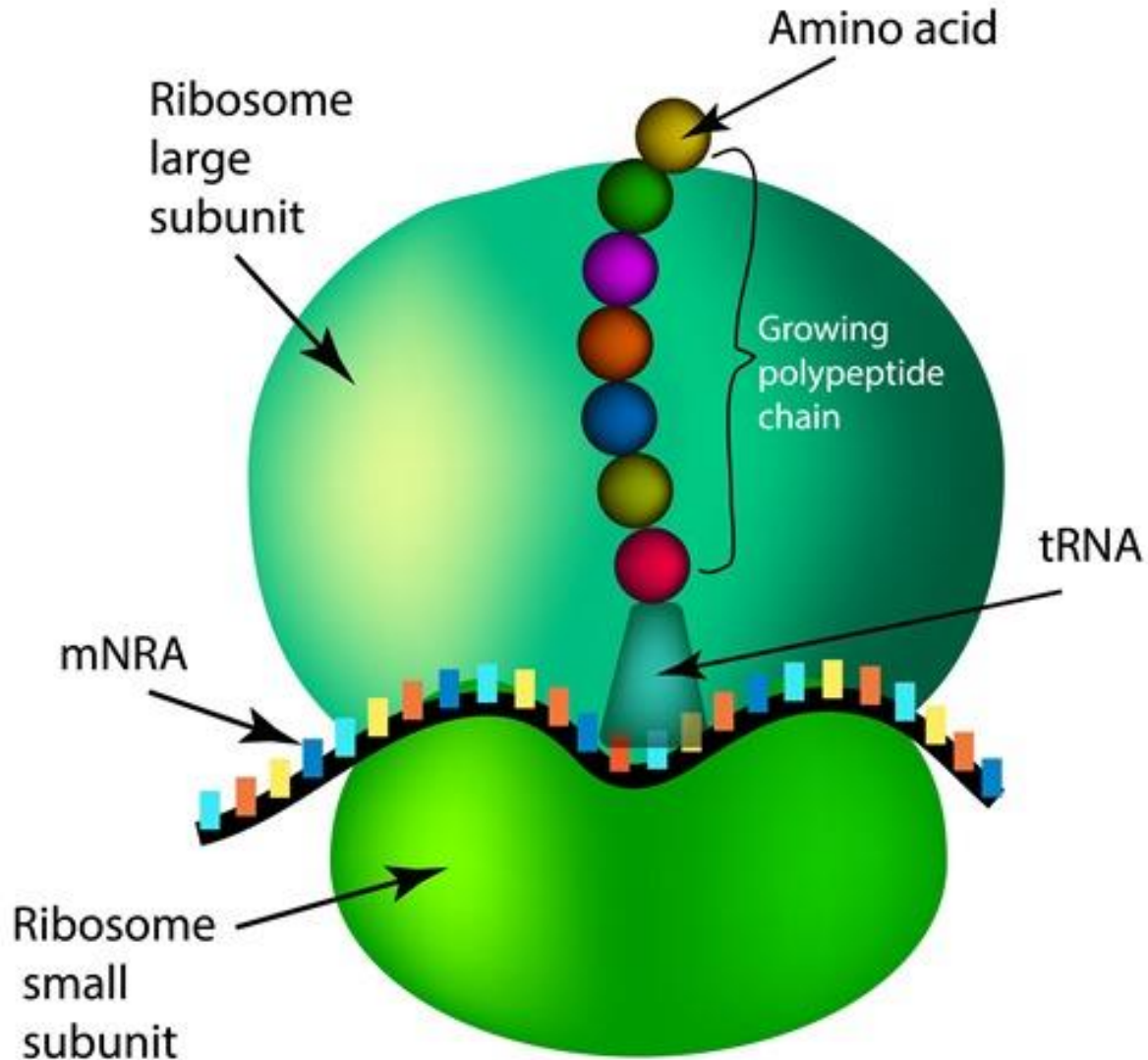
Lecture 02-03

Central Dogma of Molecular Biology

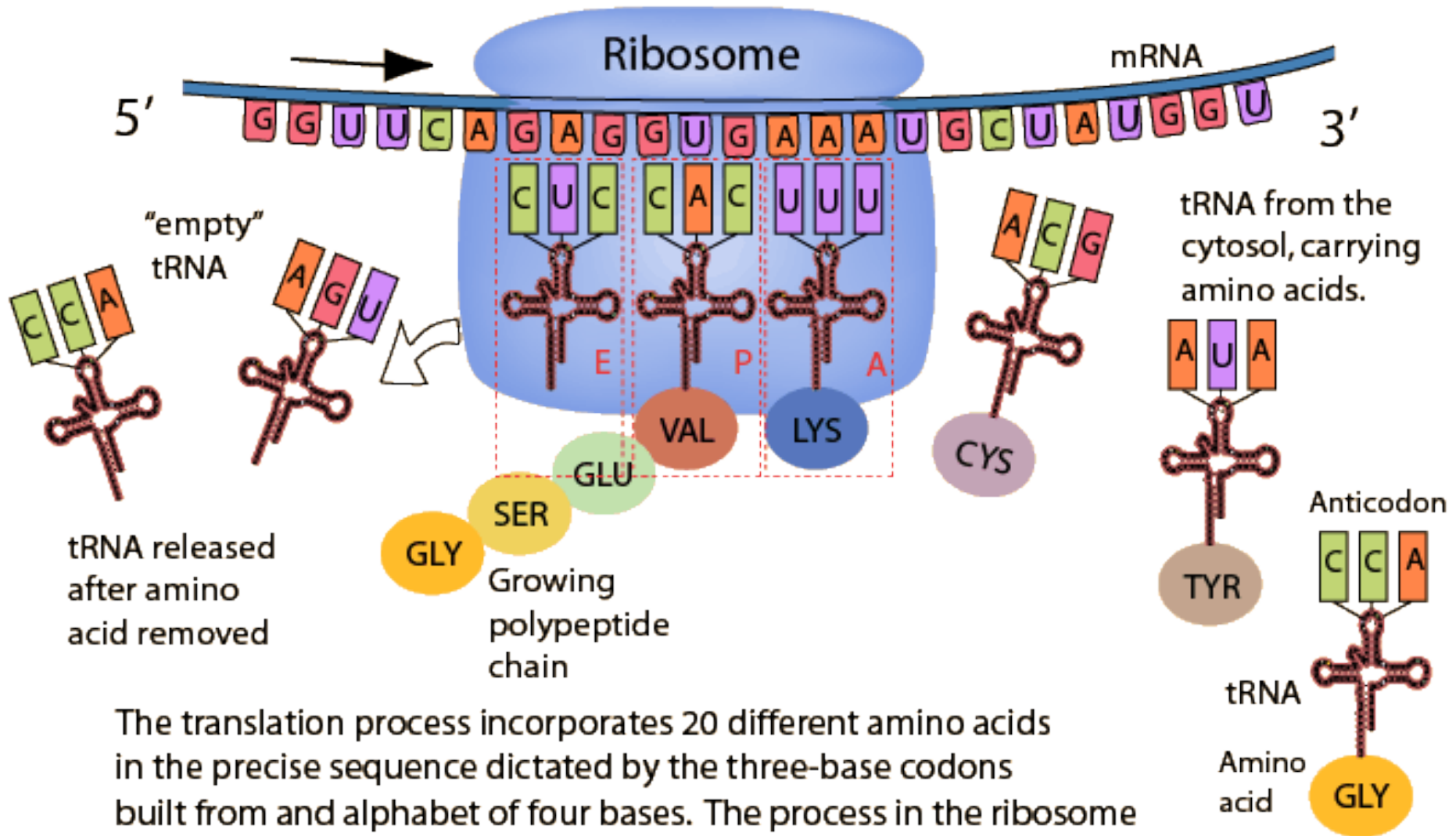


RECAP

Ribosome

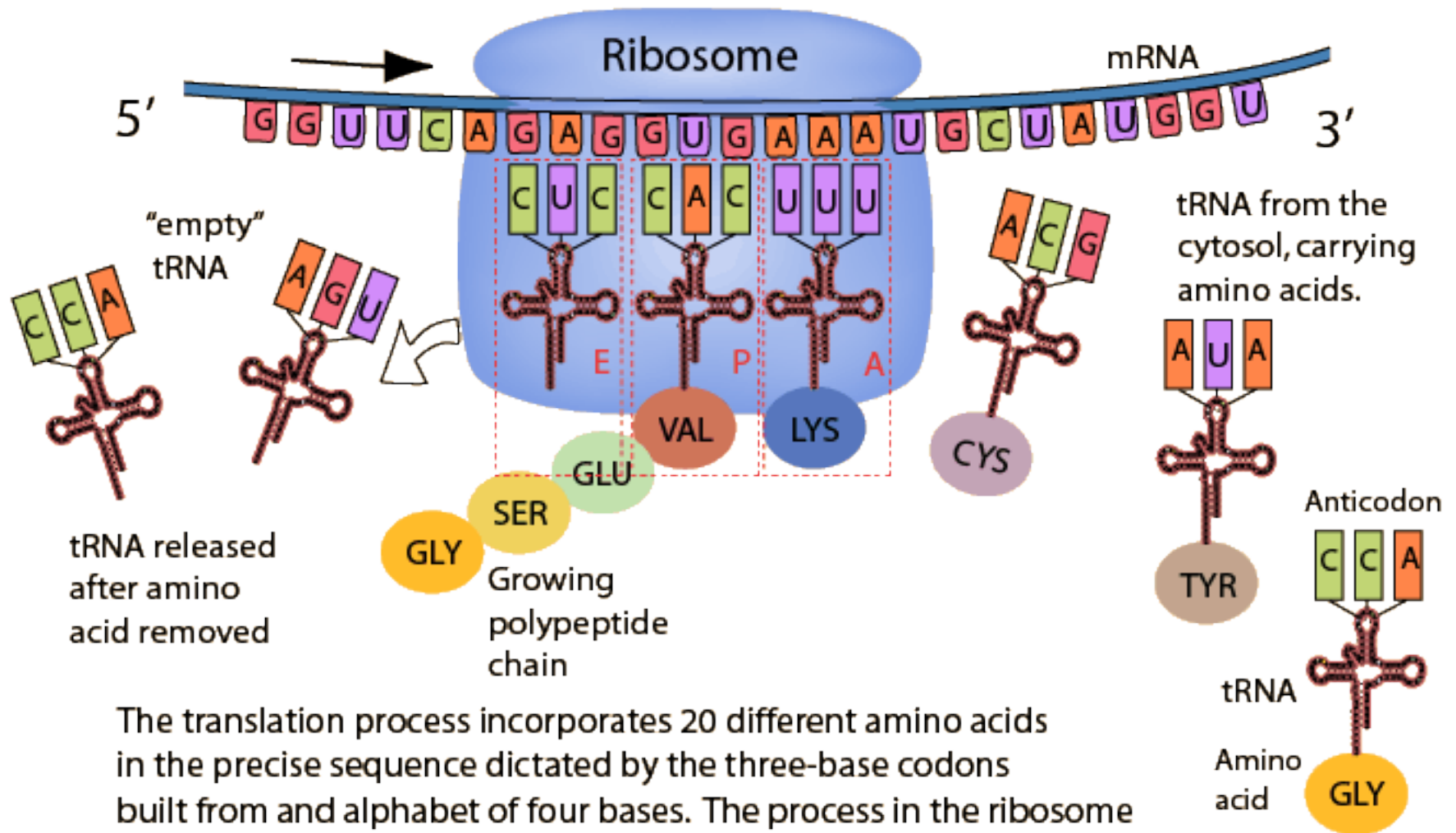


Translation



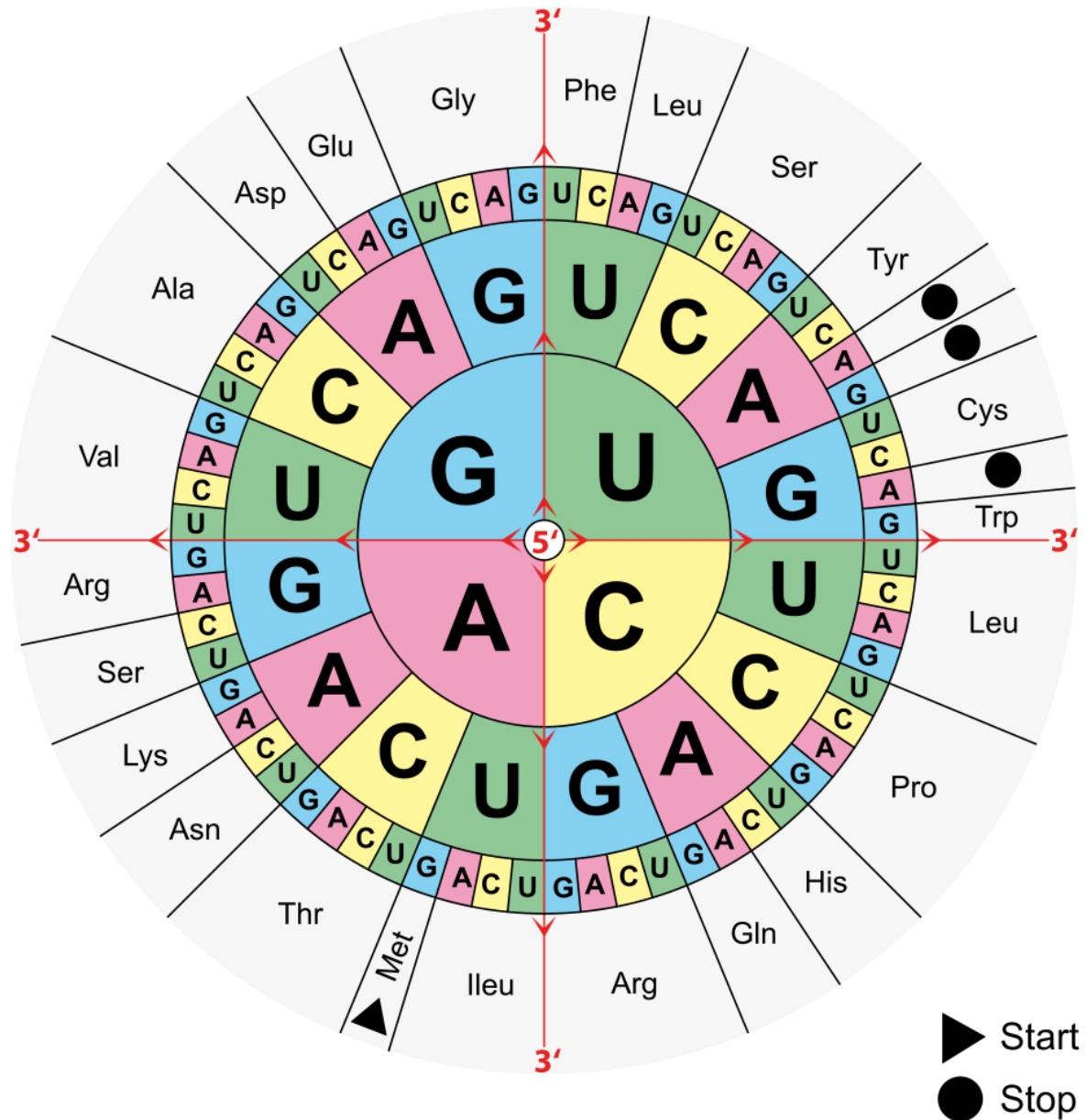
The translation process incorporates 20 different amino acids in the precise sequence dictated by the three-base codons built from an alphabet of four bases. The process in the ribosome builds the polypeptide chains that will become proteins.

Translation



The translation process incorporates 20 different amino acids in the precise sequence dictated by the three-base codons built from an alphabet of four bases. The process in the ribosome builds the polypeptide chains that will become proteins.

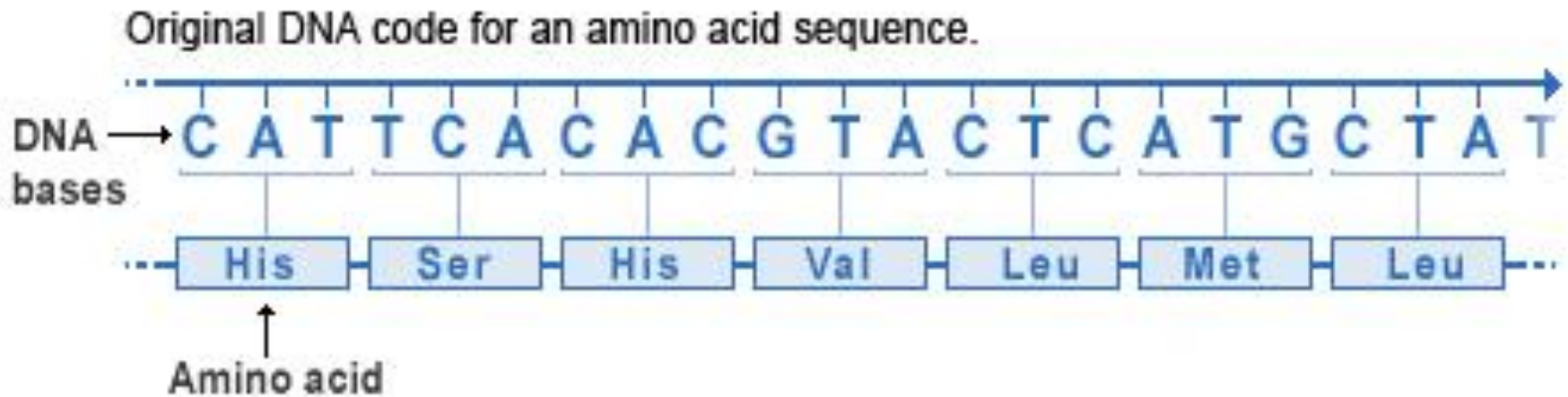
CODON WHEEL



Amino Acids

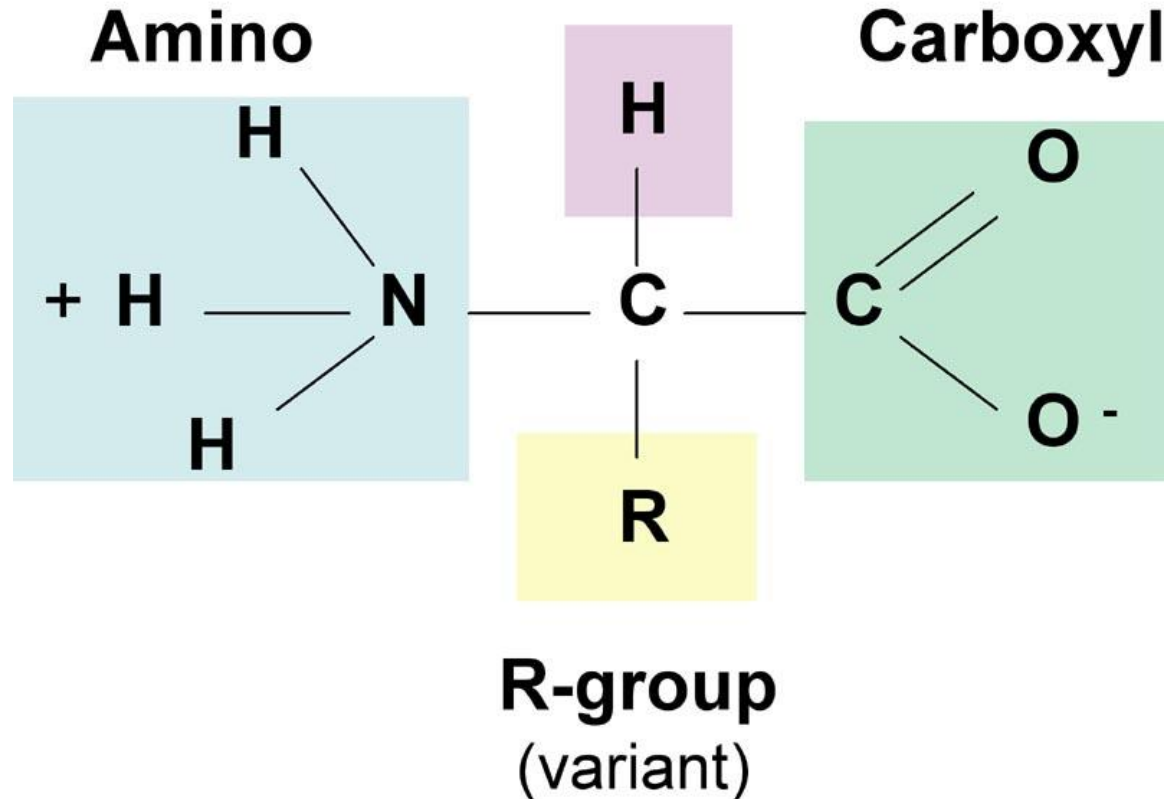
Amino Acid	3-Letter Code	1-Letter Code
Alanine	Ala	A
Cysteine	Cys	C
Aspartic acid or aspartate	Asp	D
Glutamic acid or glutamate	Glu	E
Phenylalanine	Phe	F
Glycine	Gly	G
Histidine	His	H
Isoleucine	Ile	I
Lysine	Lys	K
Leucine	Leu	L
Methionine	Met	M
Asparagine	Asn	N
Proline	Pro	P
Glutamine	Gln	Q
Arginine	Arg	R
Serine	Ser	S
Threonine	Thr	T
Valine	Val	V
Tryptophan	Trp	W
Tyrosine	Tyr	Y

Protein Sequence

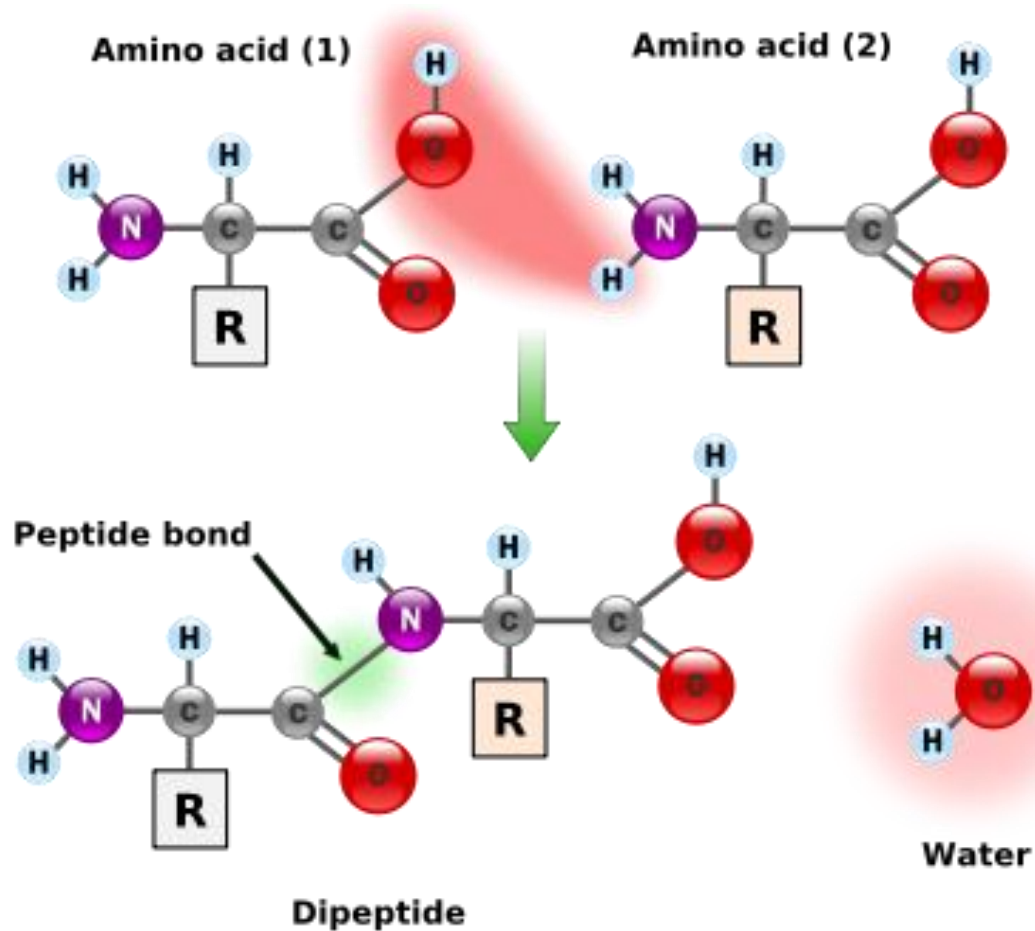


Amino Acid Structure

Hydrogen

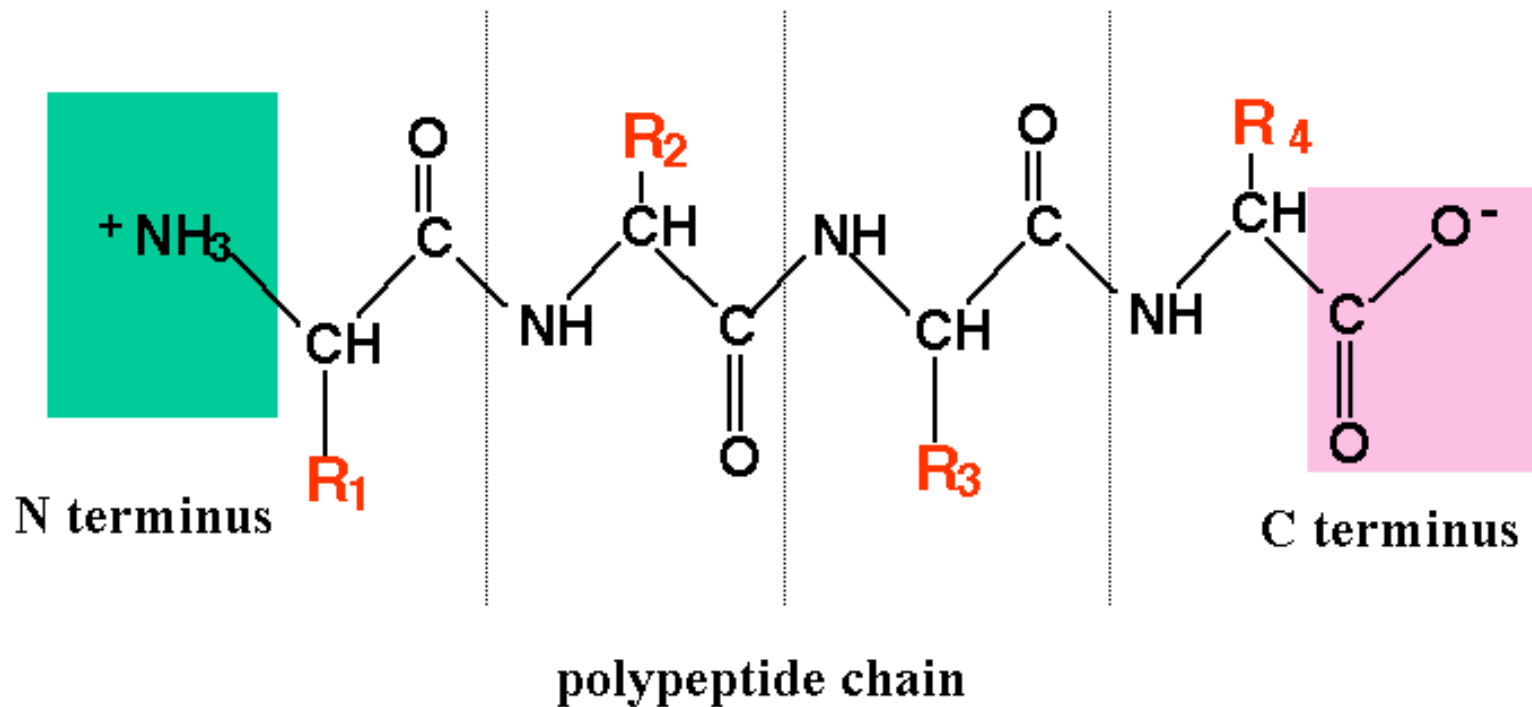


Peptide Bond Formation



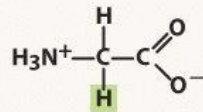
Peptide

Peptide = chain of amino acids

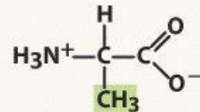


Essential Amino Acids

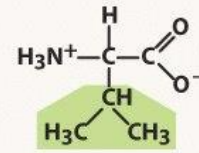
Nonpolar side chains



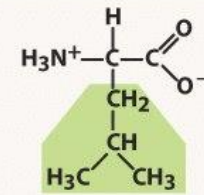
Glycine (G)
Gly



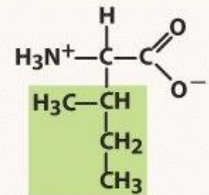
Alanine (A)
Ala



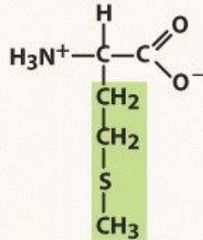
Valine (V)
Val



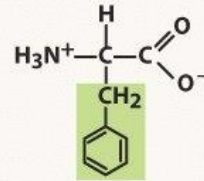
Leucine (L)
Leu



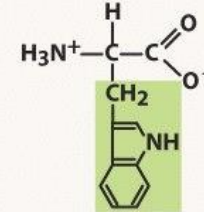
Isoleucine (I)
Ile



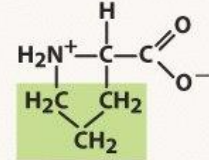
Methionine (M)
Met



Phenylalanine (F)
Phe

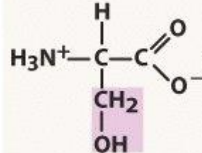


Tryptophan (W)
Trp

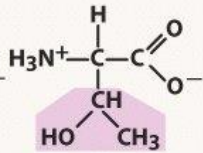


Proline (P)
Pro

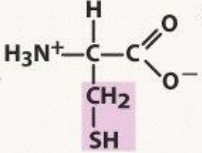
Polar side chains



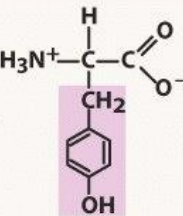
Serine (S)
Ser



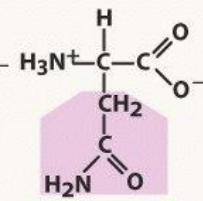
Threonine (T)
Thr



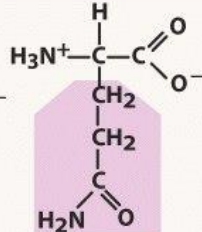
Cysteine (C)
Cys



Tyrosine (Y)
Tyr



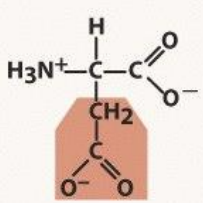
Asparagine (N)
Asn



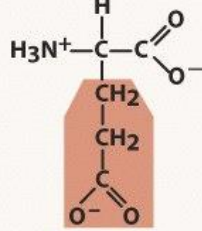
Glutamine (Q)
Gln

Electrically charged side chains

Acidic

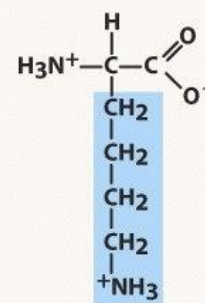


Aspartate (D)
Asp

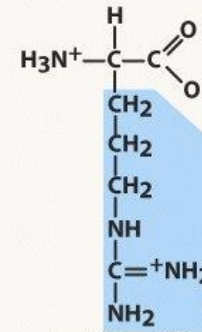


Glutamate (E)
Glu

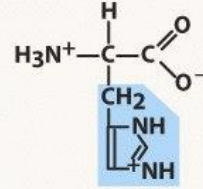
Basic



Lysine (K)
Lys



Arginine (R)
Arg



Histidine (H)
His

Point, Line, Angle, Torsional Angle

