

# Proteins

Thursday, January 23, 2020

11:01 AM

Proteins

composed of

polymers of

amino acids

(few / many)

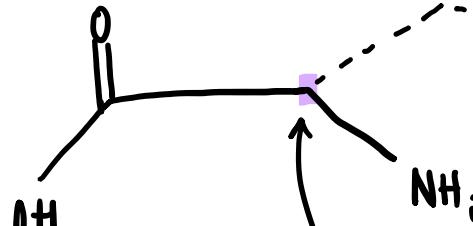
20 of them

that constitute proteins

wh  
together

backbone skeleton

H - C - A - C - O



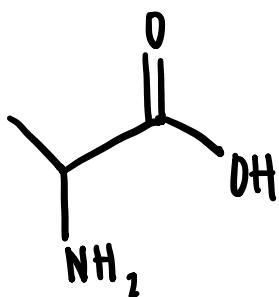
- side chains go here

- this is what confers the

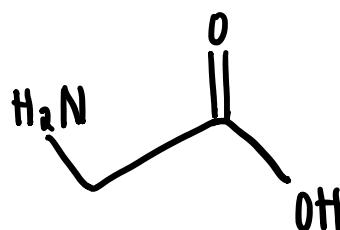
proteins are coded by DNA

- they're translated from DNA into proteins
- they're assembled amino acid by amino acid

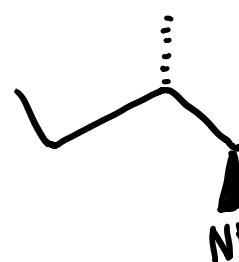
} DNA transcrip



ALANINE A



GLYCINE G

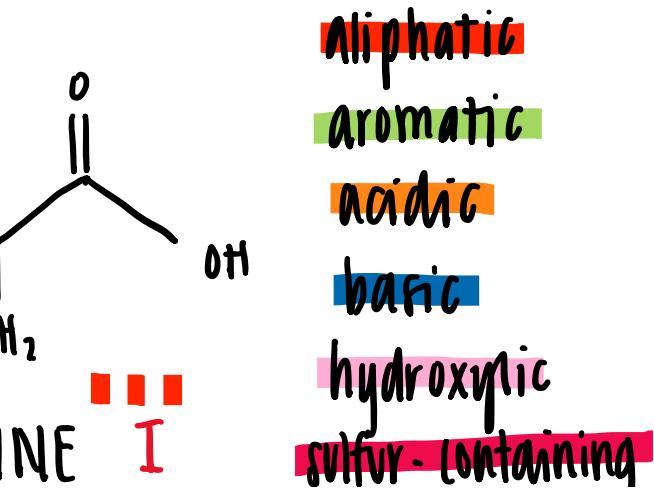


ISOLEUCINE

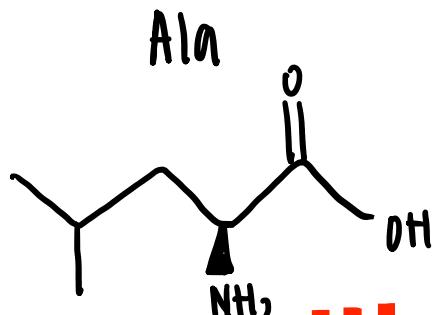
when aminoacids are bound  
together, forming **peptide bond**

identity of the aminoacids

→ RNA → **translated** protein



- aliphatic**
- aromatic**
- acidic**
- basic**
- hydroxypic**
- sulfur-containing**



LEUCINE L

Leu

aliphatic

aromatic

acidic

basic

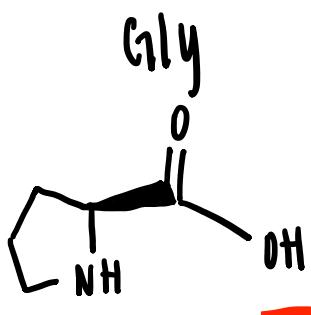
hydroxypic

sulfur-containing

amidic

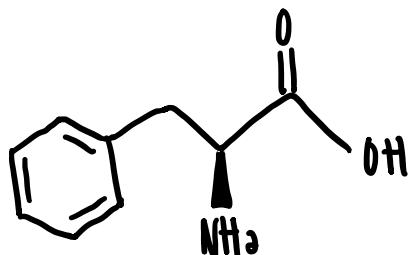
essential

non-essential



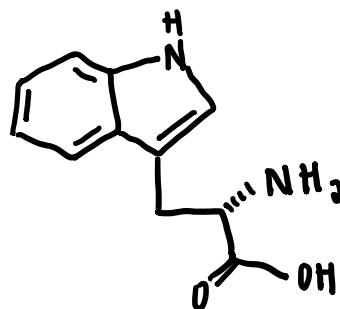
PROLINE P

Pro



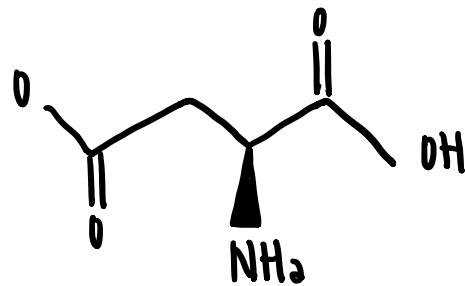
Phenylalanine F

Phe



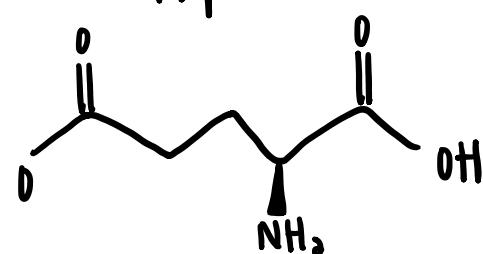
Tryptophan W

Trp



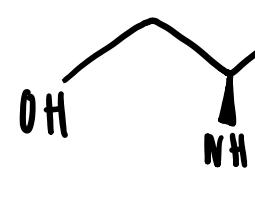
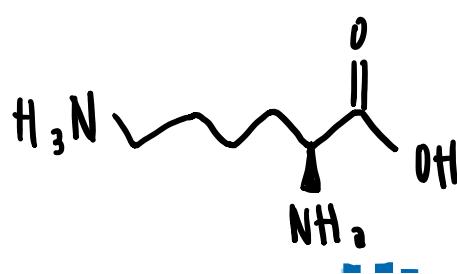
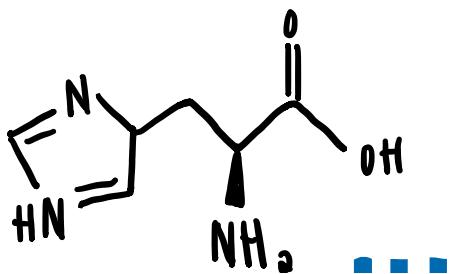
Aspartic Acid D

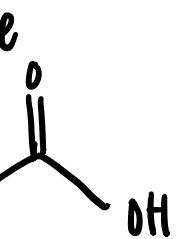
Asp



Glutamic Acid E

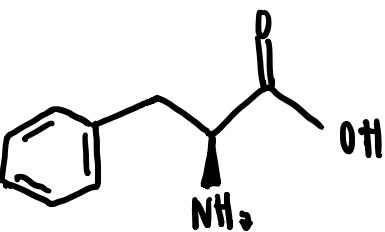
Glu



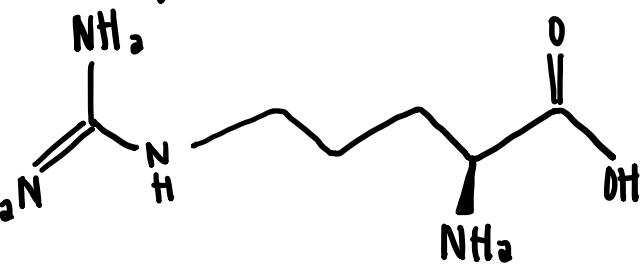


amidic  
essential —  
non-essential

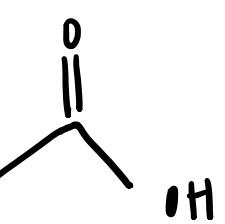
E V



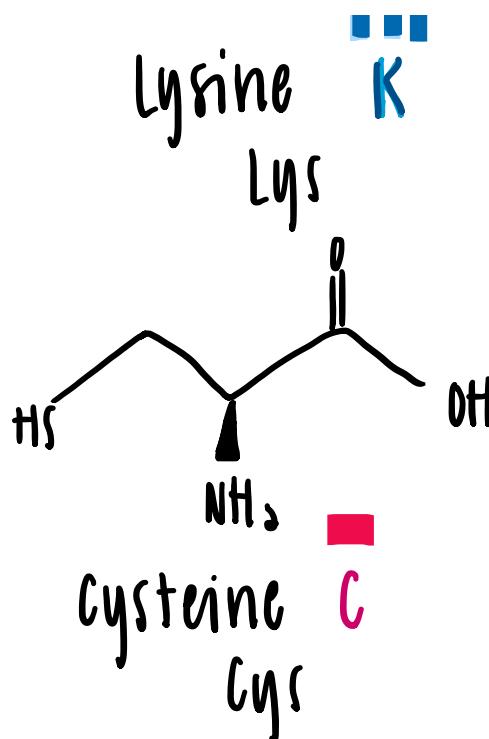
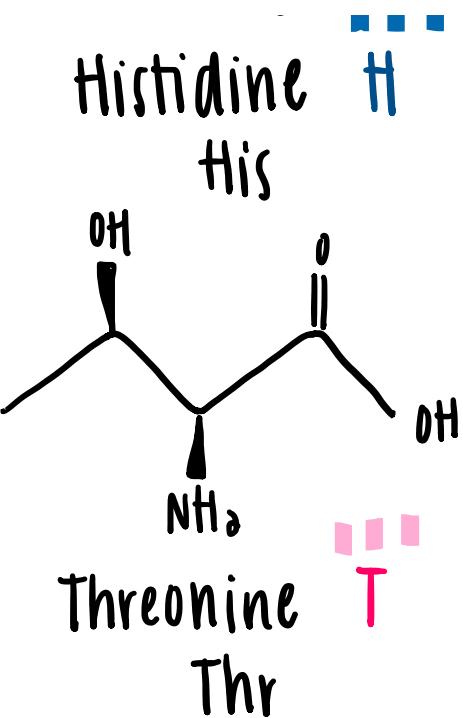
Tyrosine Y  
Tyr



Arginine R  
Arg



aliphatic  
aromatic  
acidic  
basic



**aliphatic**

**aromatic**

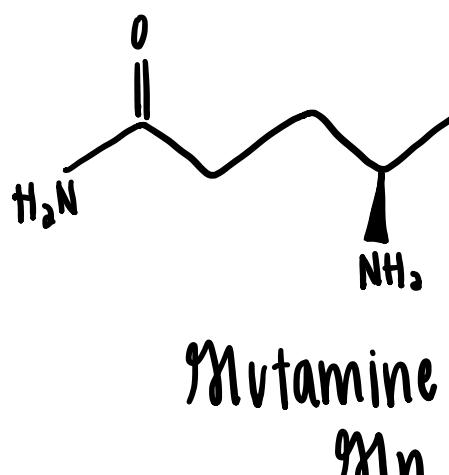
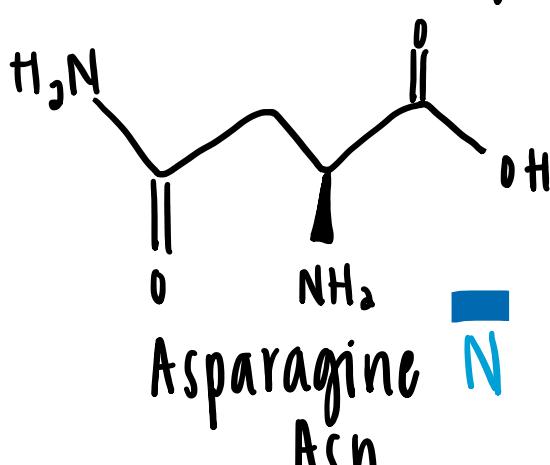
**acidic**

**basic**

**hydroxypic**

**sulfur-containing**

**amidic**, essential —, non-essential



Proteins have primary, secondary, tertiary and quaternary structure

sequence of amino acids that  
composes the protein

linear structural  
patterns (on specific parts)

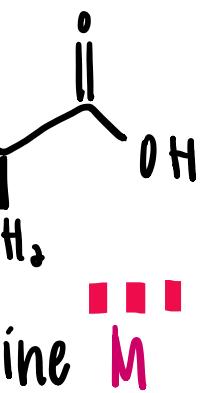
→ α - h

b -

combination of  
secondary structural elements into

combination of se

S



~~basic~~  
hydroxylic  
~~sulfur-containing~~  
amidic  
essential —  
non-essential



Q

~~ternary~~ structures.

helices → loops  
sheets

several proteins into

globular / high hierarchy shape

a protein com

## Determining structure of proteins

- crystalline structure causes a → technique to observe beam of incident X-rays to local magnetic fields around atomic NMR nuclei.
- X-ray crystallography → diffract atomic NMR nuclei. cooler
- measuring the angles / intensities → placed in magnetic field of diffracted beams & NMR signal is produced by
- the crystallographer can produce excitation of the nuclei via 3D pic of the density of c- w/in w/ radio waves into NMR the crystal
- can be determined → detected w/ sensitive radio receivers
- position of atom → the intramolecular mag. field
- chemical bonds around atom in molecule changes →
- crystallographic disorder, etc freq. @

## Lack of a structural singularity

- This is where intrinsically disordered proteins come from folded proteins ↳ populate continuum of conformations
- ↪ single conformational state "almost" random coil models → in soln
  - their secondary elements (i)

plex

→ cryogenic electron  
and microscopy, samples  
d to **Cryo-EM** cryogenic  
eld temps & embedded  
y in an environment of  
ample vitreous

→ applied to grid-mesh  
0 & plunge-frozen in liquid  
ethane

→ determination of bio  
resonance molecular structures  
near atomic resolution

in  
ions that range  
panoply of secondary  
structure elements  
(if exists) lack the

ability to cooperatively fold &  
tertiary structure

stabilize into a