March 25, 2003

PS #7 chapt 25 (2nd ed'n)
(last one !) #24-30.

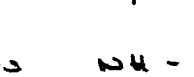
Walker Summer Research Awards.

- 2 x 1500
- not for summer NSERC holders
- need a research supervisor who will pay at least this amount.
- deadline April 21

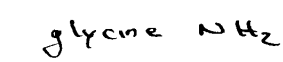
email: robert_wightman @ carleton.ca

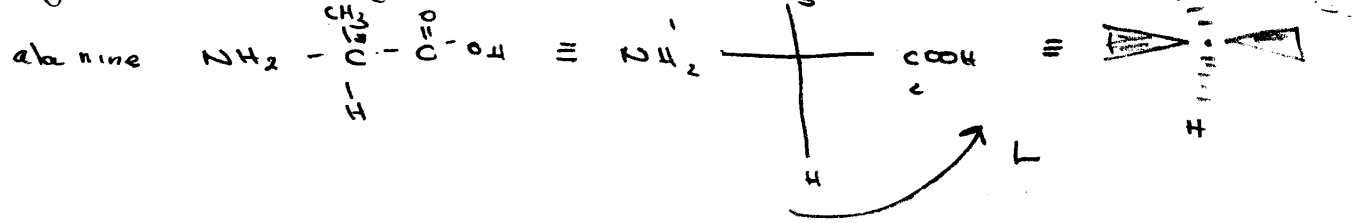
20 amino acids (total)

10 essential (dietary sources only)

"L" amino acids 

Chirality - all are chiral except glycine.

glycine 

alanine 

Of the 19 chiral amino acids used in human protein production all are L except for cysteine (R)

Combinations of amino acids.

2 amino acids: a Dipeptide.

3 amino acids a Tripeptide

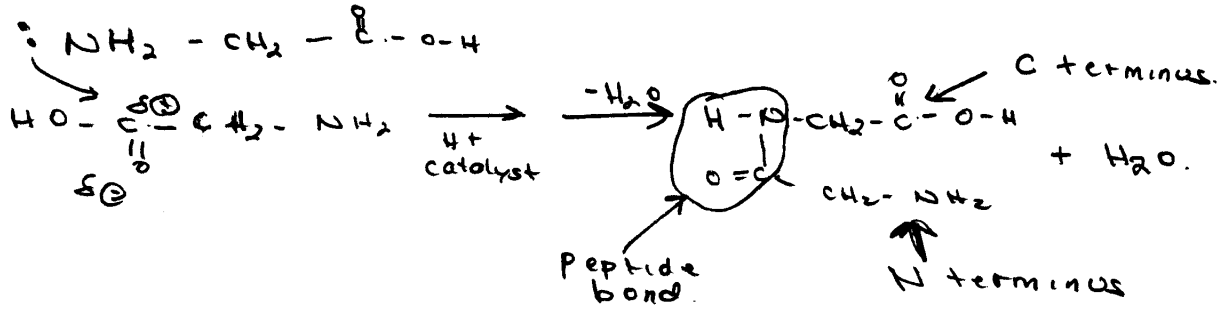
4-15 amino acids an oligopeptide

>15 amino acids polypeptides

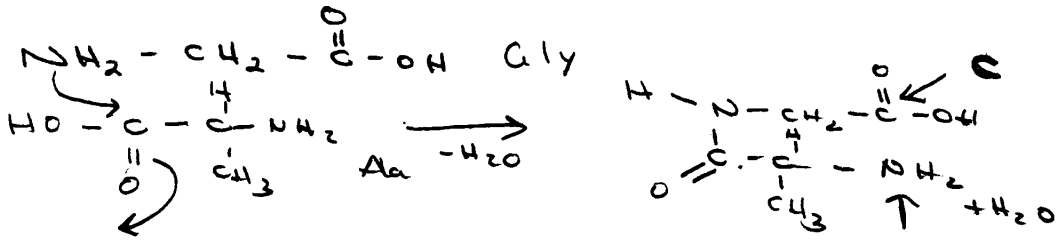
<u>Peptide bond</u> (formally an amide)

$-N-\overset{\overset{O}{\|}}{C}-$ If mix Glycine (Gly.) × Alanine (Ala)

→ 4 possible dipeptide Gly-Gly, Ala-Ala, Ala-Gly, Gly-Ala



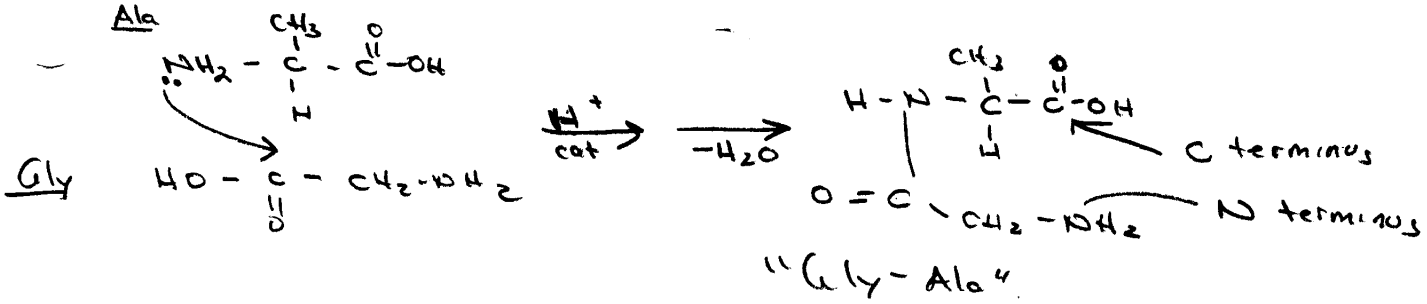
Ala - Gly
Gly - Ala



Ala-Gly

N terminal

C terminal.



"Gly - Ala"

P 1272 structures of 20 Amino Acids.

Acid - base properties of amino acids.

Expt ① Amino Acids are generally water soluble, but not highly soluble in organic solvents.

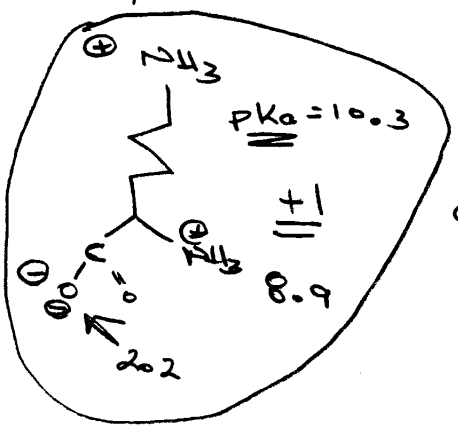
② Very high melting point (NaCl has one of the highest)

2. Witterionic Form of Amino Acids

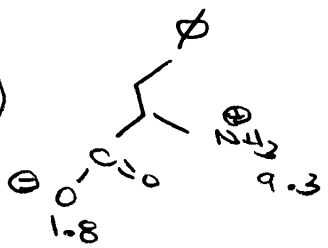
Glycine

Alanine

Lysine

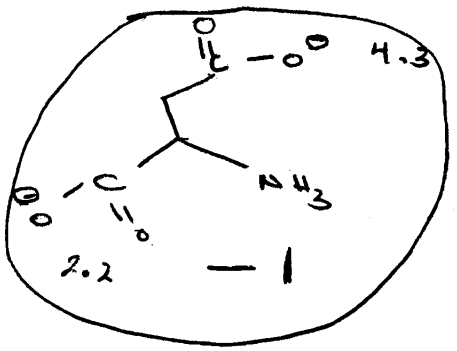


phenyl alanine



NEUTRAL

Glutamic Acid



* If pH is less than pKa, the site will be protonated *

at pH of 5.5: can separate these 3 amino acids ≥ by electrophoresis

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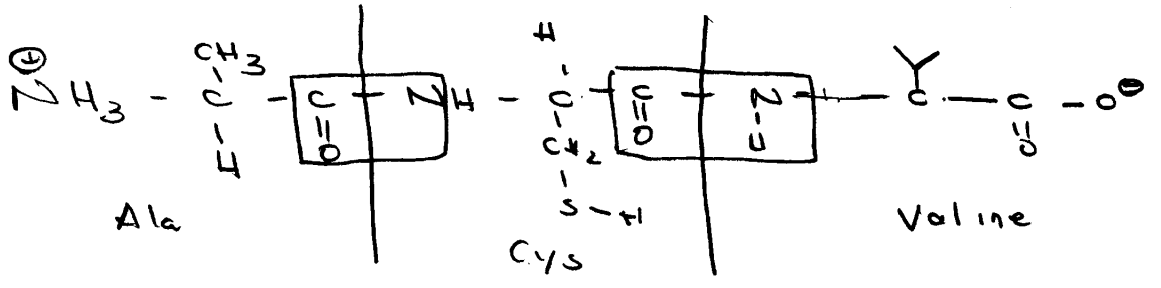
Structure Det'n of Proteins & Polypeptides:

via "Amino acid analyzer"

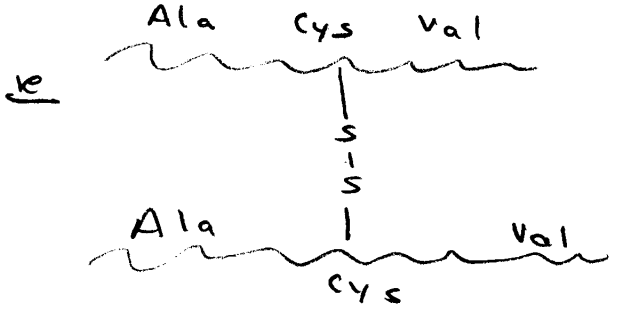
- use enzyme: "carboxypeptidase" — cleaves C terminal amino acids sequentially ! !

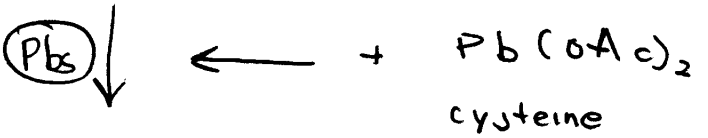
Primary Structures: of proteins / peptides — sequence of amino acids linked via peptide bonds.

Secondary structure: Ala - Cys - Val



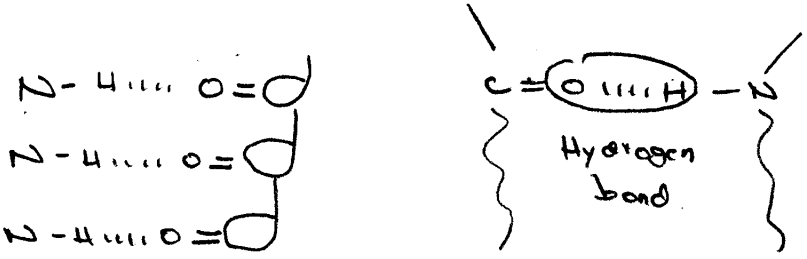
One type of secondary structure arises from disulfide linkages between chains.



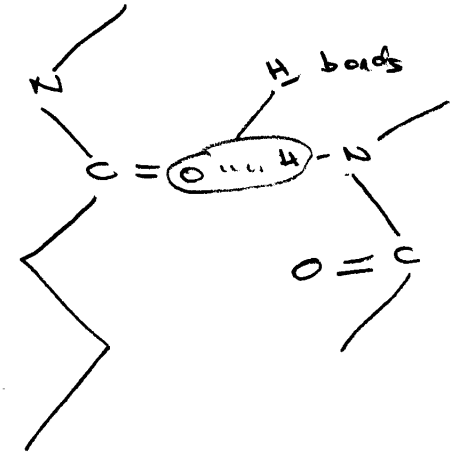


cysteine

α-helix - stabilized by hydrogen bonding.



β - Pleated sheet



Random Coil

X-ray structure
I 2 Å res'n.