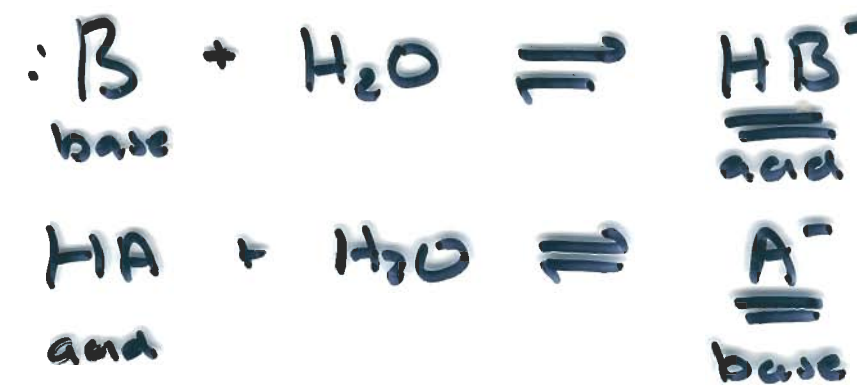


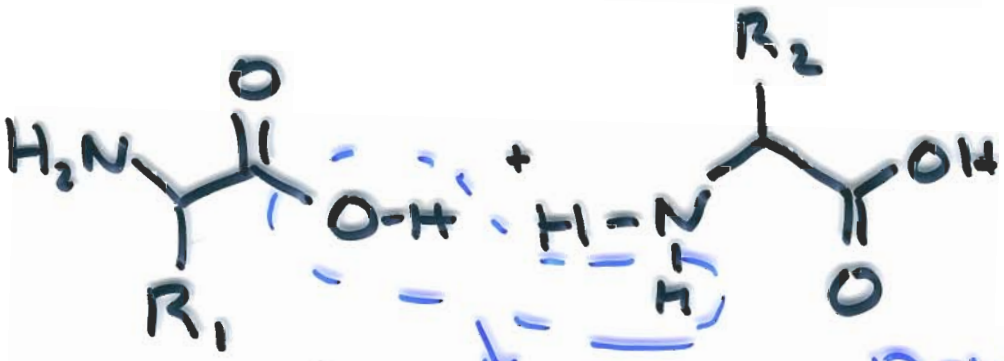
Remember

- [ACID] = [BASE] then pH = pKa

Also true

- pH = pKa then [ACID] = [BASE]
- pH > pKa then [BASE] > [ACID]
- pH < pKa then [ACID] > [BASE]

Structure of Proteins

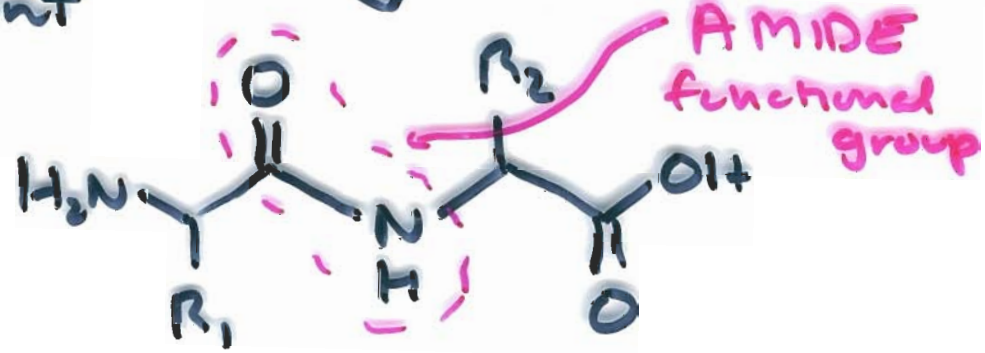


Amino acid

H_2O

Dehydration Rxn
(not Acid-Base!)

20 different "R" groups

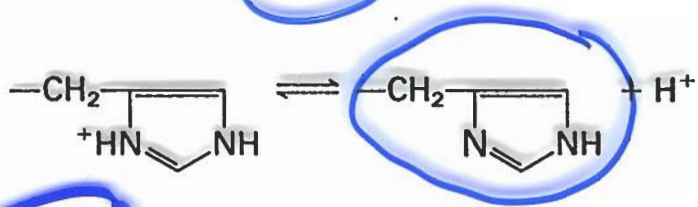
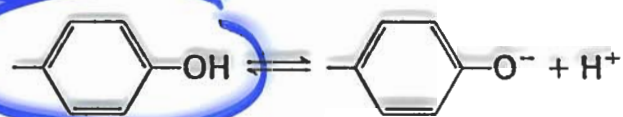
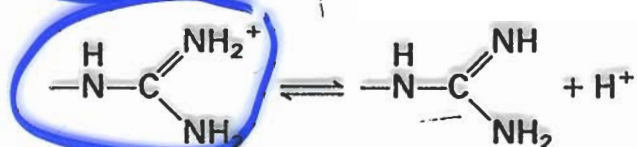


Chain of 100+ amino acids = protein

Protein "folds" into well-defined 3-D structure

ACTIVE FORM - 3D structure is key to its function

Table 2-1
pK values of ionizable groups in proteins

Group	*Acid* $\rightleftharpoons$ *base* + H^+	*Typical pK*a*
Terminal carboxyl	—COOH $\rightleftharpoons$ —COO^- + H^+	3.1
Aspartic and glutamic acid	—COOH $\rightleftharpoons$ —COO^- + H^+	4.4
Histidine		6.5
Terminal amino	—NH_3^+ $\rightleftharpoons$ —NH_2 + H^+	8.0
Cysteine	—SH $\rightleftharpoons$ —S^- + H^+	8.5
Tyrosine		10.0
Lysine	—NH_3^+ $\rightleftharpoons$ —NH_2 + H^+	10.0
Arginine		12.0

*pK values depend on temperature, ionic strength, and the microenvironment of the ionizable group.

form that predominates @ pH 7.4

Biological pH ~ 7.4

pH 7.4 is on the "basic" side of the pKa so basic form of conj. acid/base pair predominates in soln.