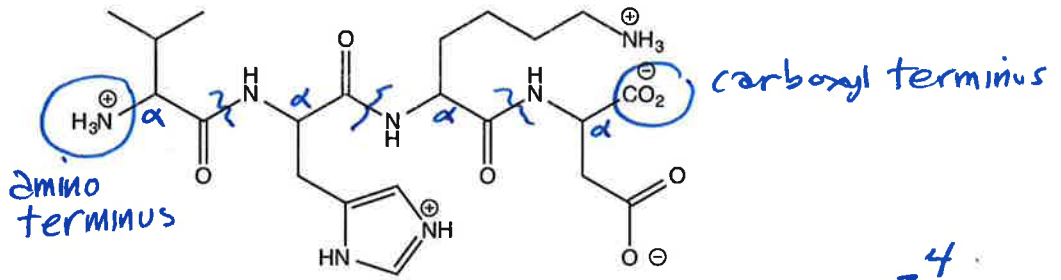
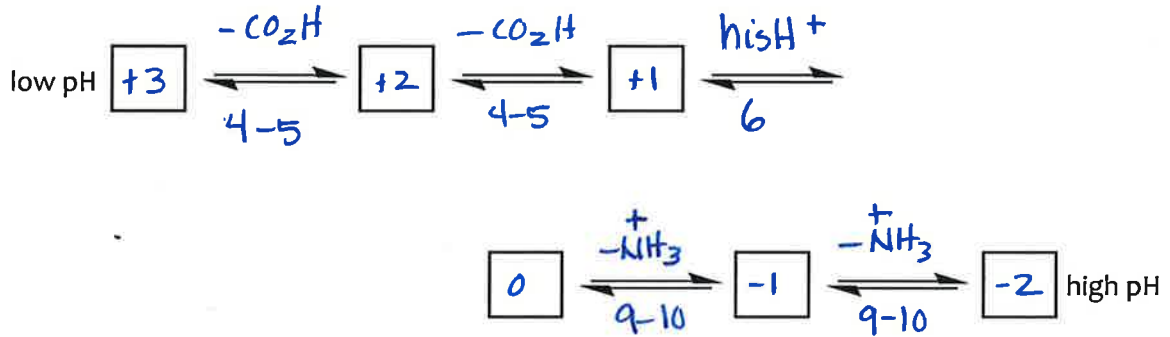


Fun with Peptides

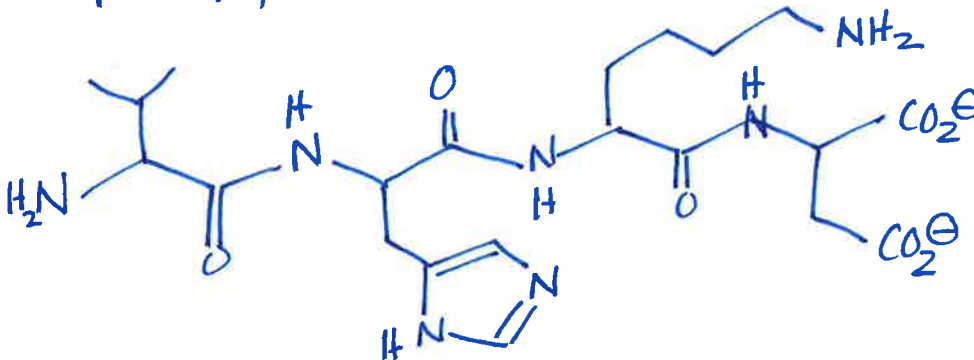


- Label the α -carbons. Put a wavy line through each peptide bond. How many amino acids are present? Circle the amino terminal and carboxyl terminal. What is the name of the ring? *imidazolium*
- Give the sequence in both 3-letter and 1-letter abbreviations. *val-his-lys-asp VHKD*
- Shown below is a shorthand describing the equilibrium this peptide experiences as it is 'titrated' from low pH to high pH. In each box, indicate the net charge on the peptide. Above each equilibrium arrow, give the pK_a for that transition. Below each arrow, indicate what group is ionizing.



- What is the pI of this peptide? $pI = \frac{6+9}{2} = 7.5$ or a little higher
- According to Table 3-6, pepsin has a very low pI. What kinds of amino acids must be common in pepsin in order to create this low pI? What if the pI were high, say over 10?
- For this peptide, there are 6 structures that vary in their net charge. One of them is the one given above. Write out the full structure of one of the five other structures.

-2 species, present at pH 10 or higher



pepsin must have a lot of carboxylic acids

if the pI were high, there would have to be many basic residues like aminos, arg etc