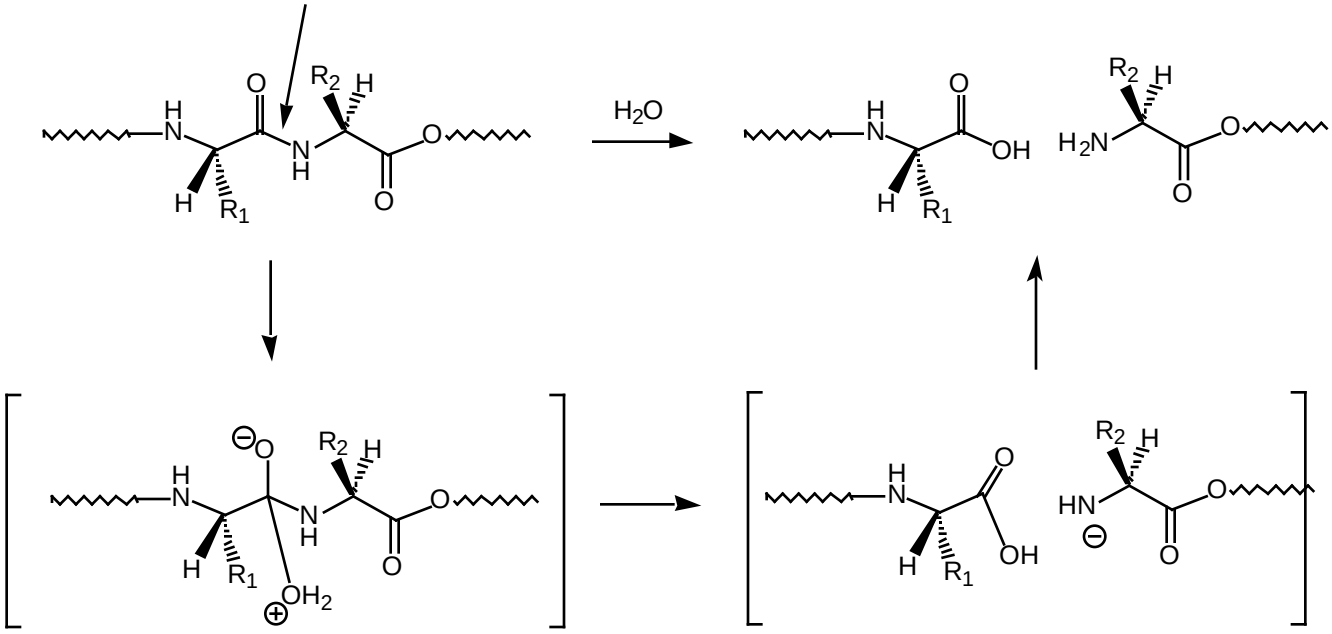
Chemistry 304B, Spring 1999 Lecture 32

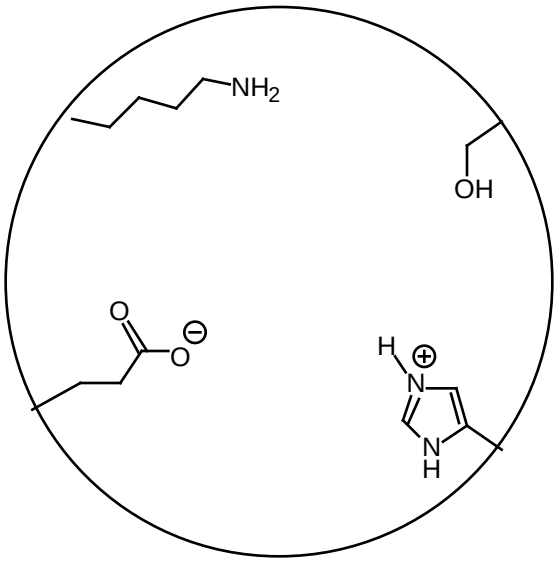
The action of a TRYPSIN enzyme. [Trypsin Handout]

Carries out the hydrolytic cleavage of an amide bond: Digestive system, etc.



Catalyzed by acid OR base.

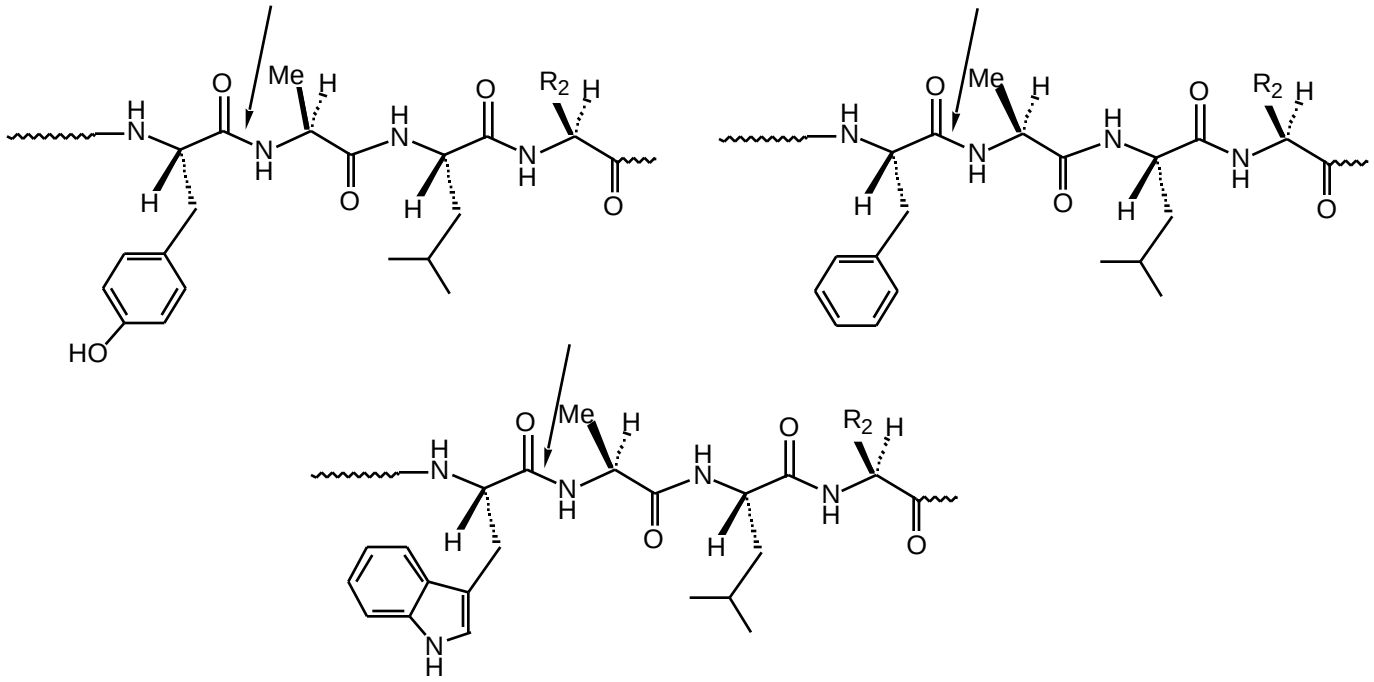
Enzyme: peptide side chains can serve as acid (weak) AND base (weak)



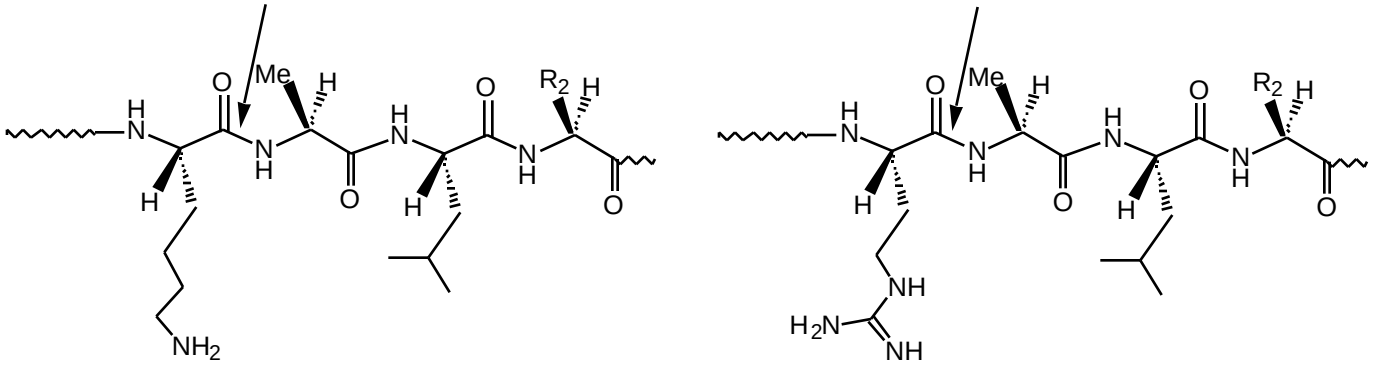
Breaking the amide bond can be done selectively between certain amino acids. Enzyme "recognizes" the AA side chain and flanking AA side chains (molecular association) and binds them to the "active site" forming an enzyme-substrate complex, E-S.

Chymotrypsin: a serine protease (serine important in the active site)

Recognizes AA with aromatic side chains



Trypsin: Also a serine protease, cleaves at lysine and arginine



These "digestive" enzymes can be used for sequencing proteins:

Take large protein, and allow trypsin to do its job: generate fragments of modest length (polypeptide)

allow chymotrypsin to do its job; generate <u>different</u> fragments of modest length

Separate the fragments and carry out the Edman degradation to find the sequence for each polypeptide

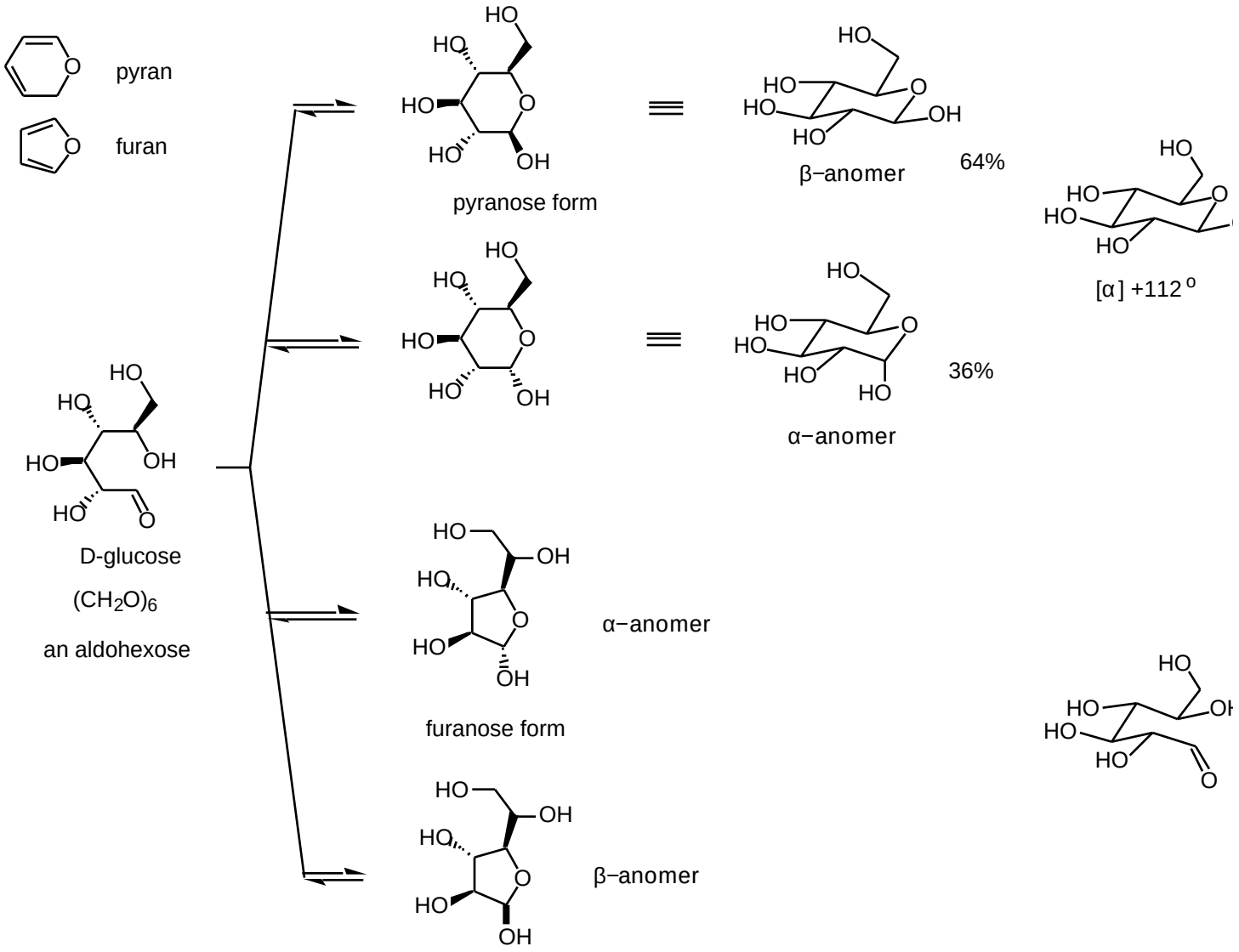
Work backwards to piece the fragments together

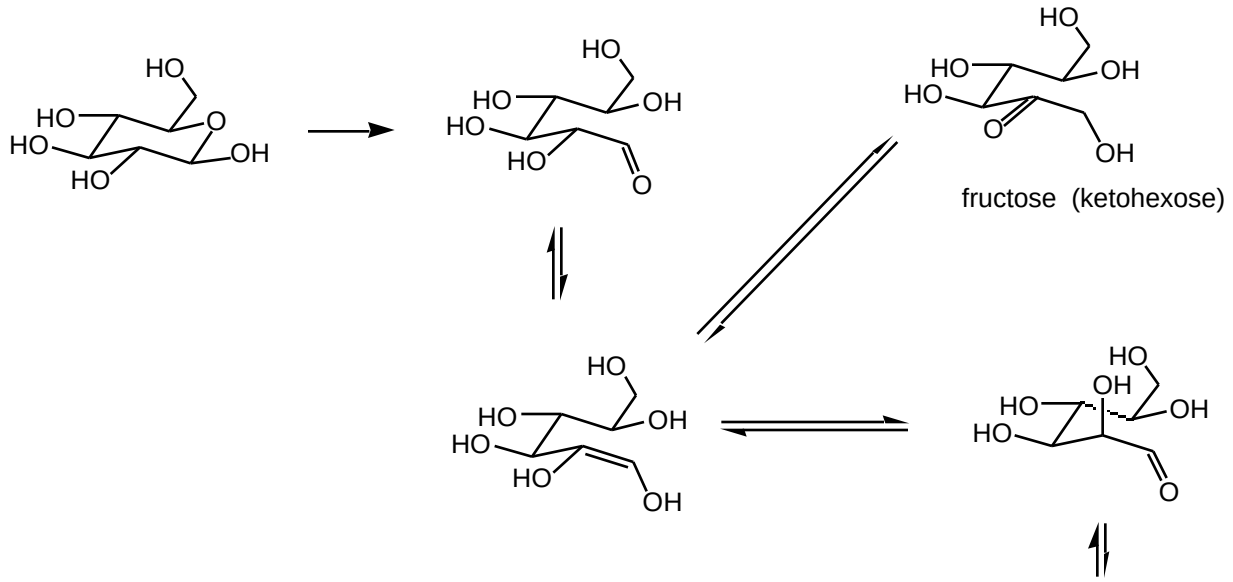
Cf Protein Handout, pp 21-22 Text: prob 26.21

NEW SECTION: carbohydrates

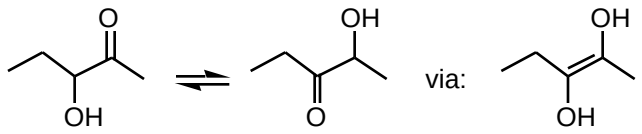
[refined reading list for Chapter 24: Read 24.1 (will not be tested); pp 1240-1241; 1246-1249; 1270-1275
Read the Handout "Carbohydrates..."

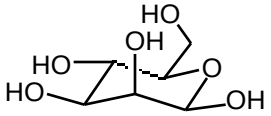
Glucose:





General:



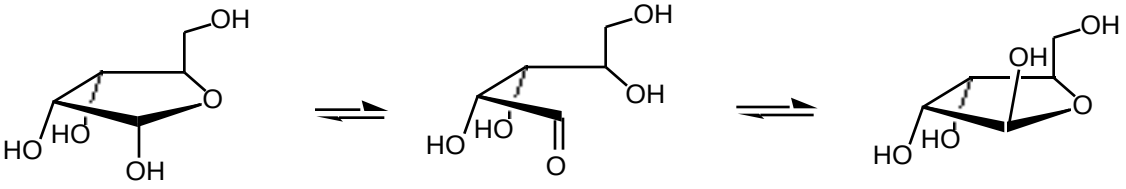


mannose
(in its pyranose form,
β-anomer)

There are 16 aldohexoses: can you draw them?

Do it when you are having trouble falling asleep; it is pretty tedious.

Five carbon sugars: $(CH_2O)_5$

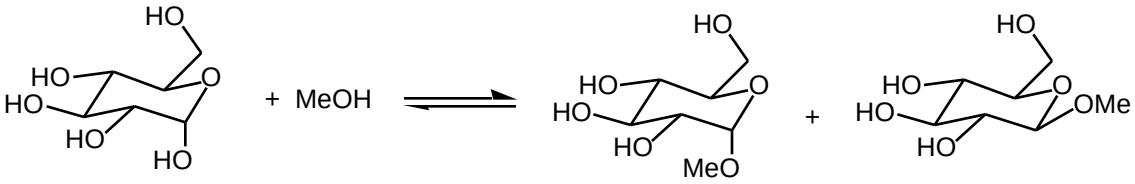


ribose
(furanose form,
α-anomer)

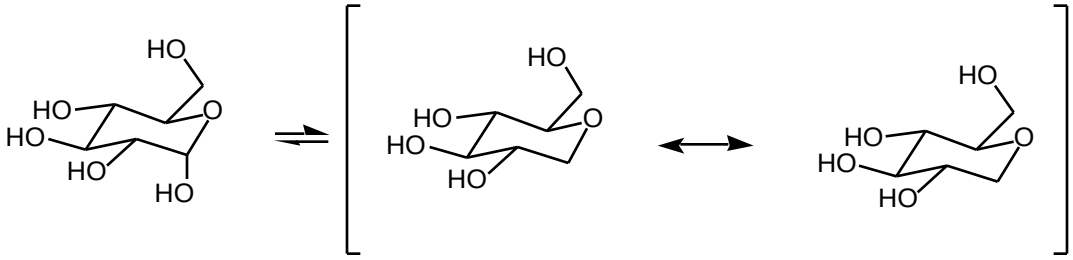
β-anomer

8 stereoisomers in this series (aldehyde form)

Most important reaction of sugars: Glycoside bond formation

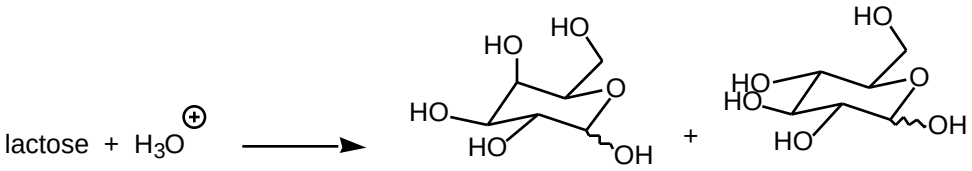


both anomers of the methyl glycoside
glucopyranoside

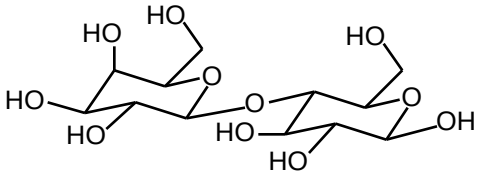


Many common sugars are disaccharides (two sugar units): $C_{12}H_{22}O_{12}$

sucrose, lactose, maltose



galactose glucose



β-linked glycoside bond to the 4-OH group of glucose