(20) **Today**

6.5 An Enzymatic Mechanism

Next Class (21)

Chap 7: Carbohydrates

(22) **Second Class from Today**

Chap 7: Carbohydrates

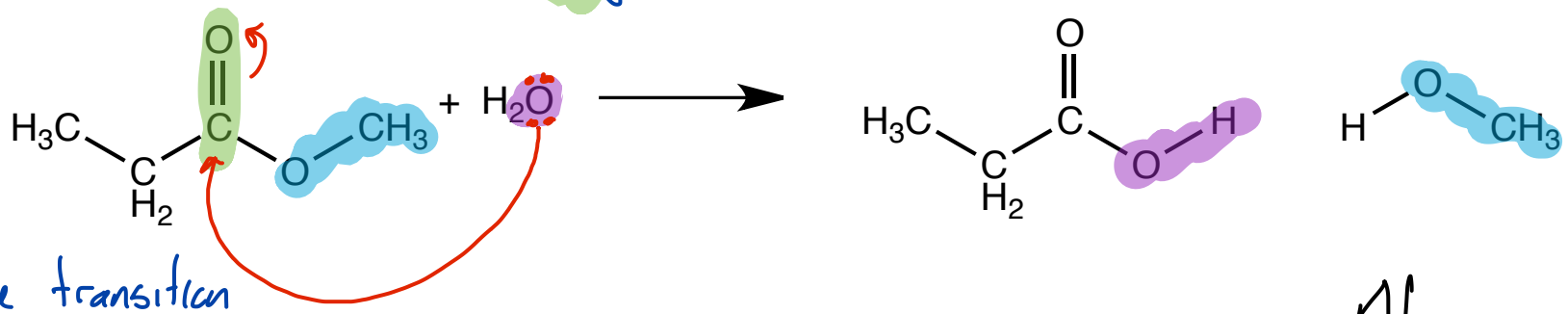
Third Class from Today (23)

Test 2

Test 2 postponed to Wednesday, April 2

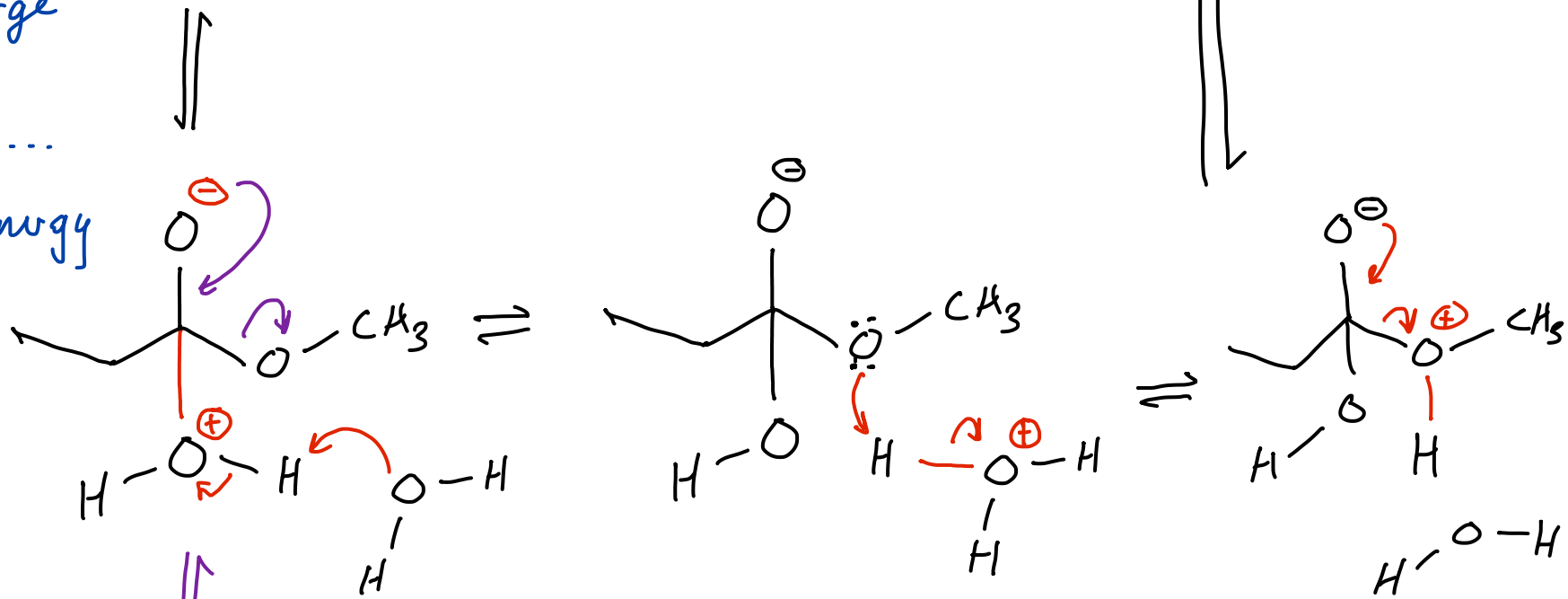
Ester Hydrolysis: Uncatalyzed

acyl substitution

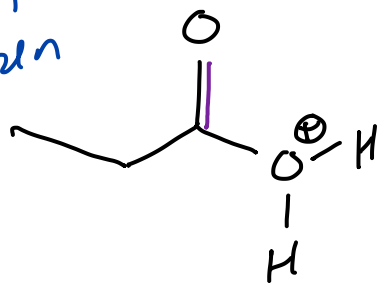


in the transition state charge separation builds up...

It takes energy to separate charges.



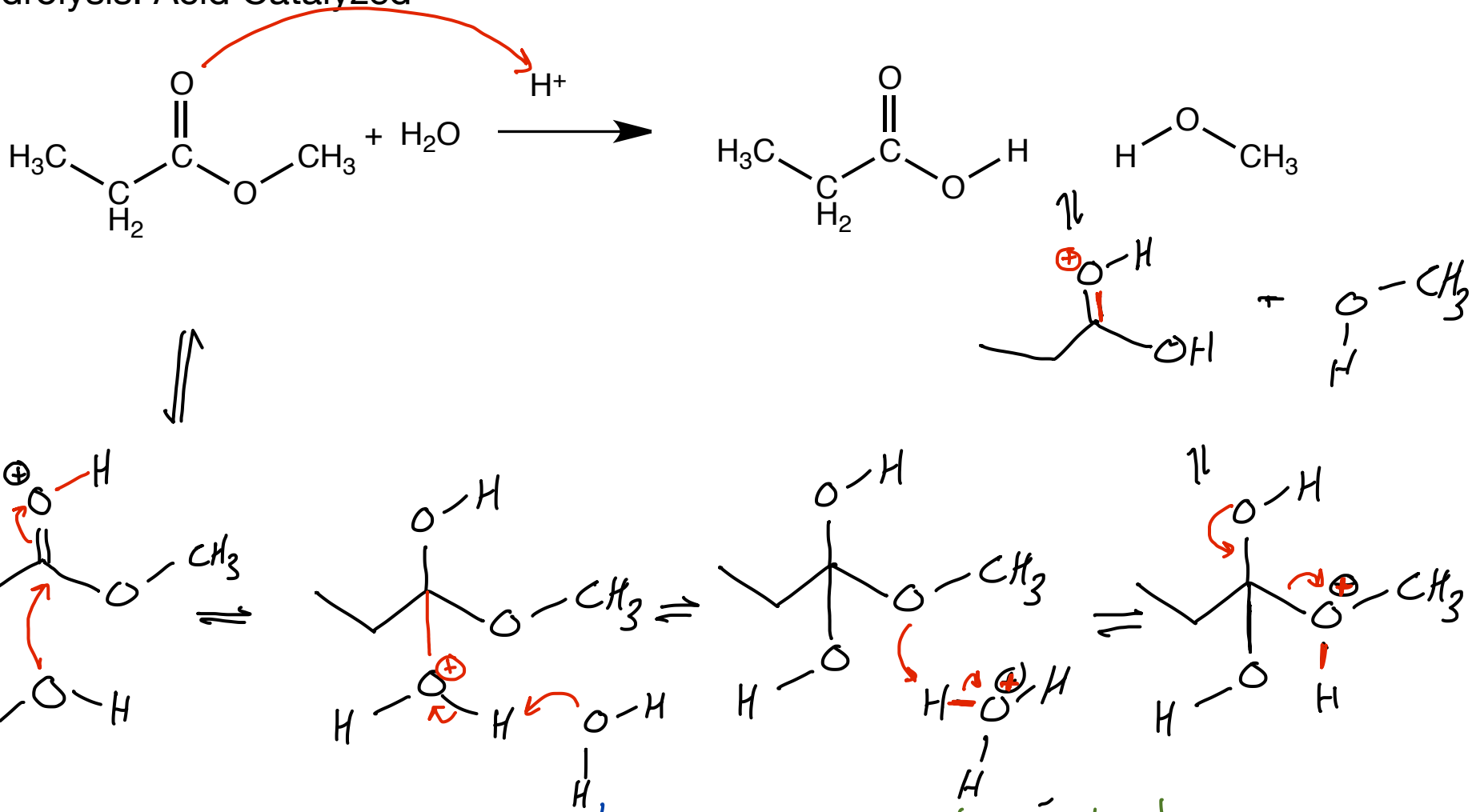
not going to happen



$^{\ominus}O-CH_3$ ← this is an organic analog to $^{\ominus}O-H$

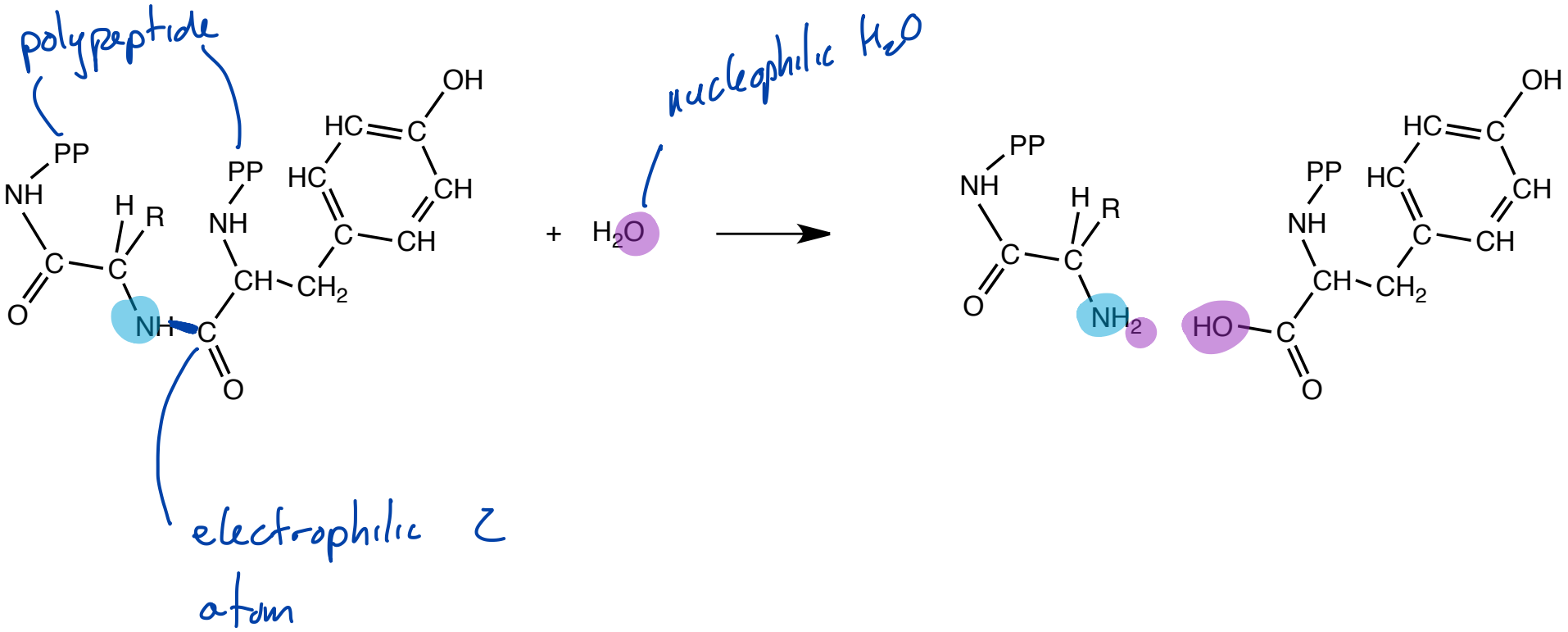
$^{\ominus}OH$ is a strong base ... high E

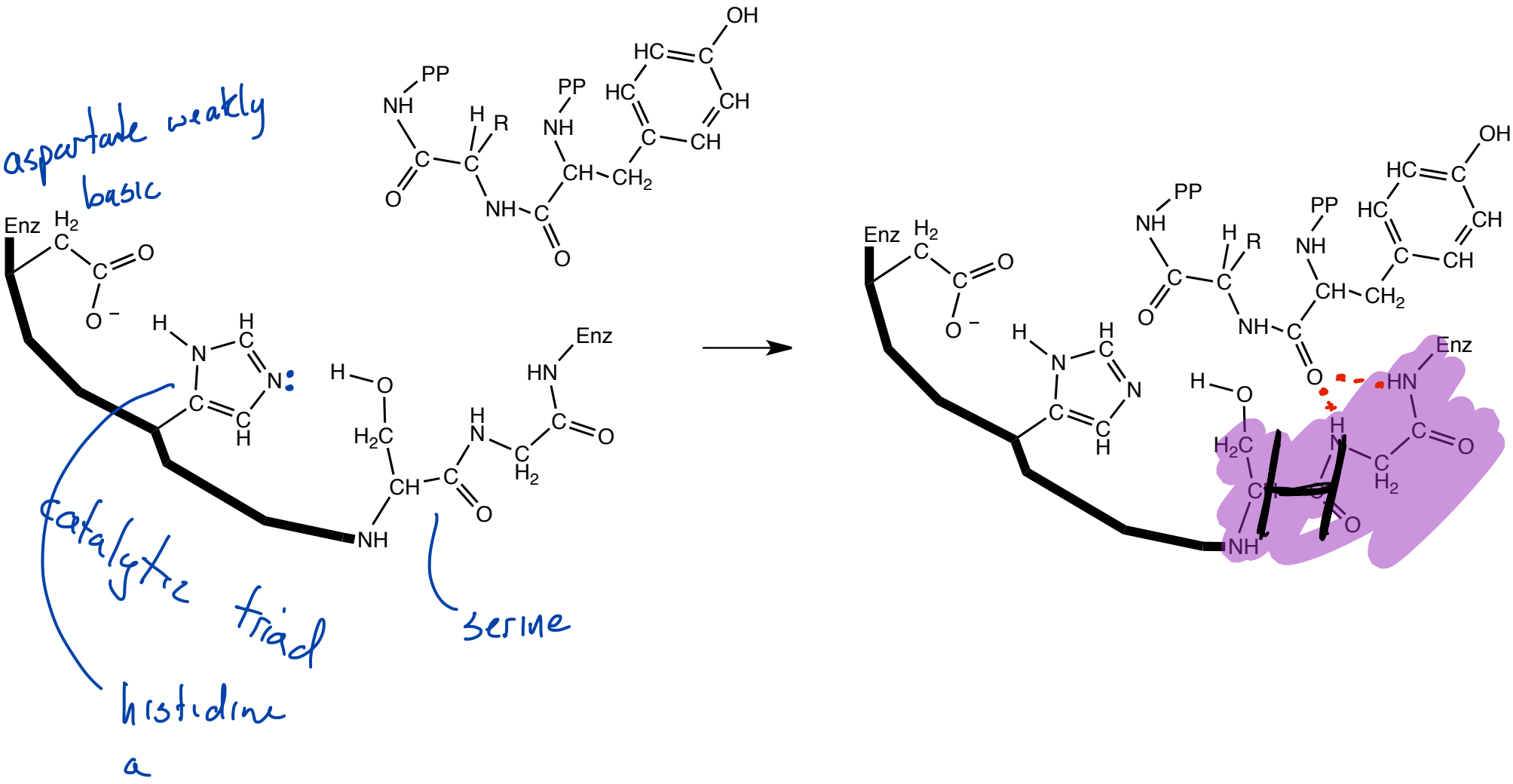
Ester Hydrolysis: Acid Catalyzed



Amide/Peptide Hydrolysis

6.05A.4



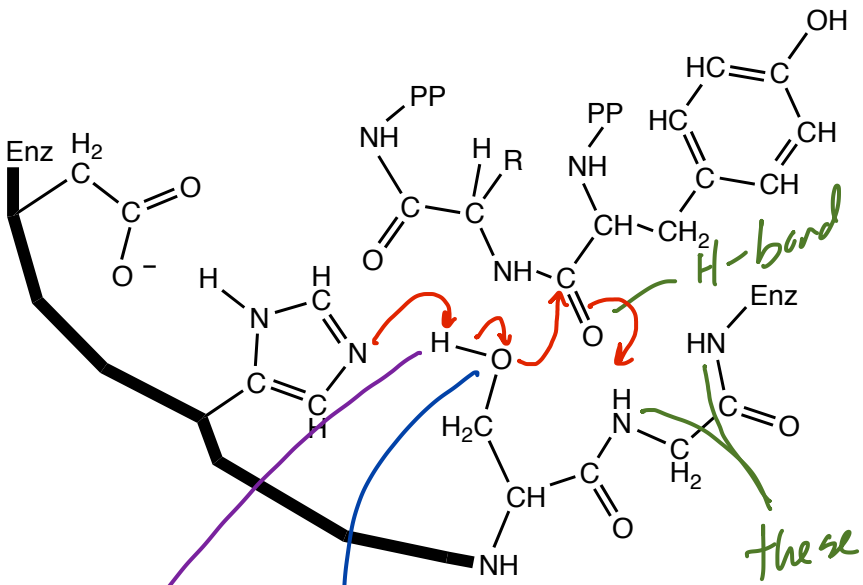

aspartate weakly basic
catalytic triad
histidine
a
serine

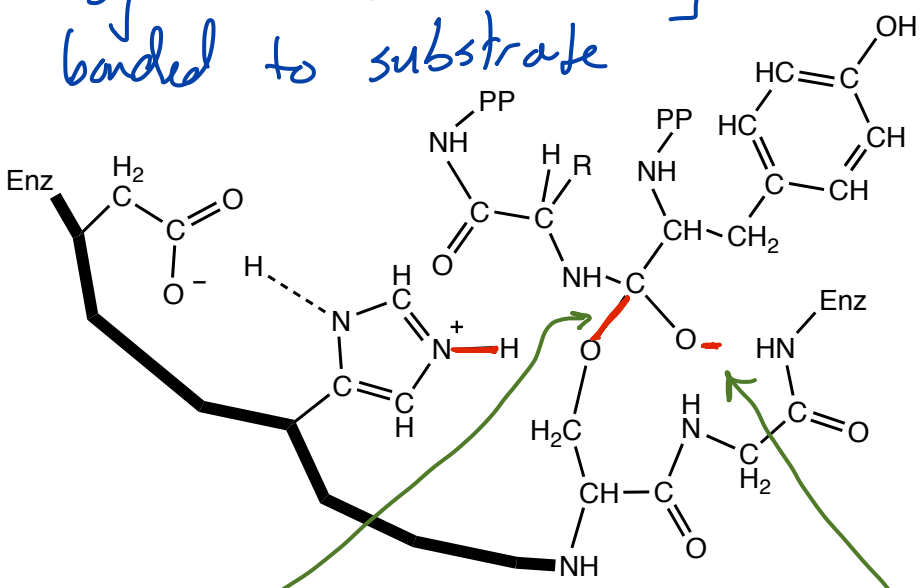
An Enzymatic Mechanism: A Serine Protease

6.05A.4

covalent catalysis

enzyme is now covalently bonded to substrate





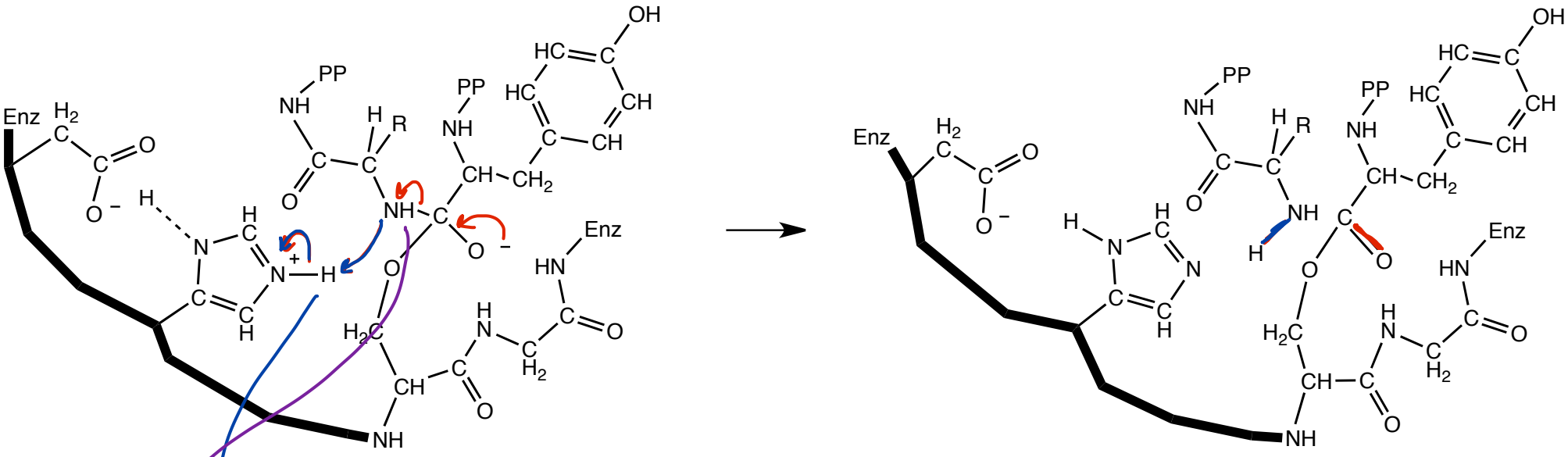
H-bond acceptor

these N-H's are H bond donors

this O is a nucleophilic O just like the O in H_2O

the active site of the enzyme stabilizes this ⊖ and makes it easier for this C to O bond to form

H of serine's OH is near the basic N of the histidine... the N can grab onto the H making to O more e⁻ rich

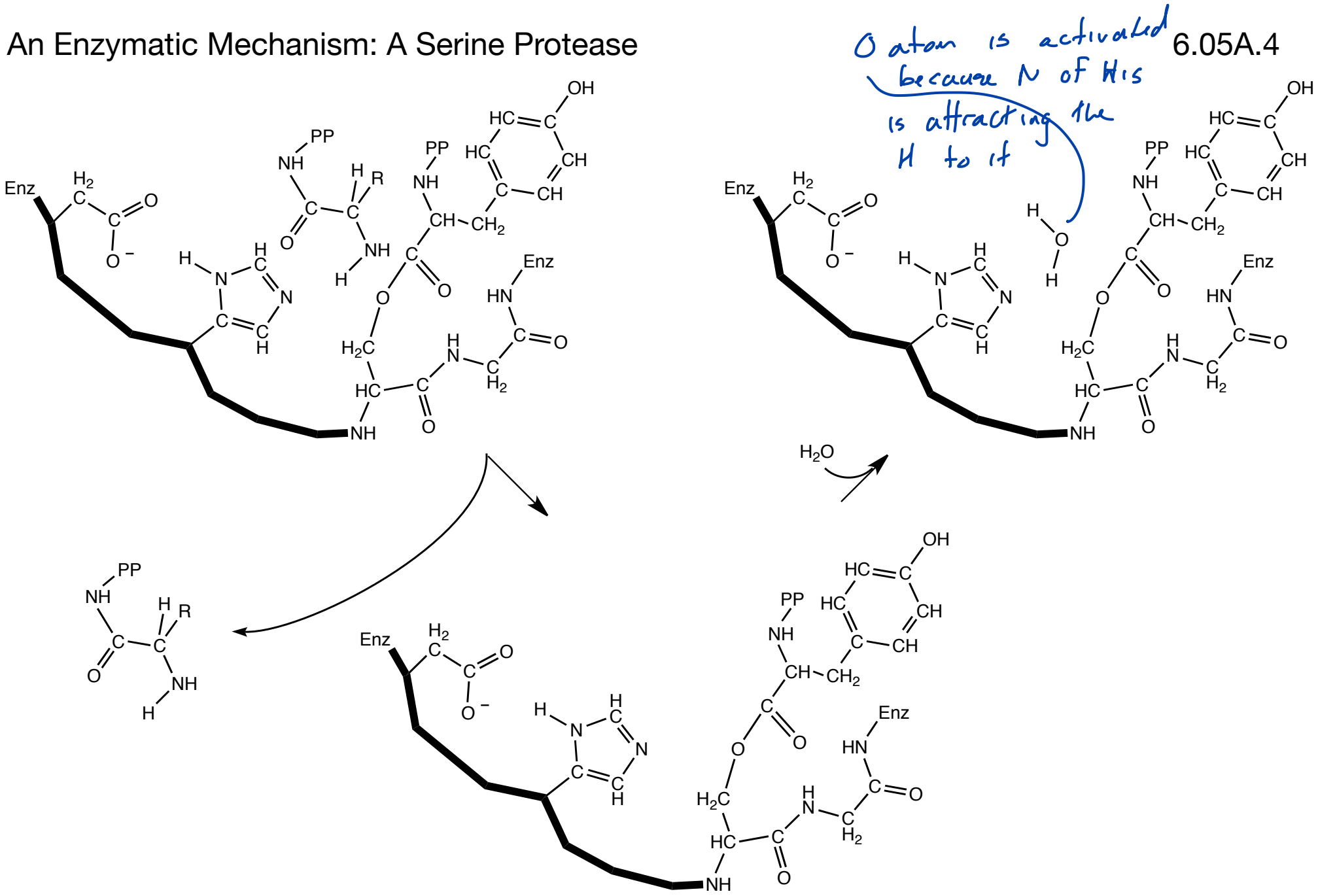


the H that was part of the serine OH can be transferred to the N of the amide

adding the H to this N means the leaving group will be PP-NH_2 instead of PP-$NH^{\ominus}$

An Enzymatic Mechanism: A Serine Protease

6.05A.4



An Enzymatic Mechanism: A Serine Protease

6.05A.4

Chymotrypsin Ester Hydrolysis