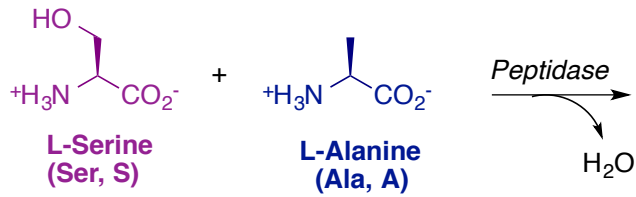
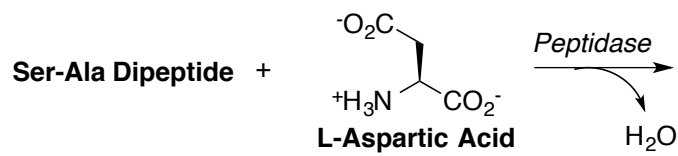


LECTURE OUTLINE

- Peptides – McM 26.9
  - Biosynthesis – Ribosomes
- Enzymes – Nature's Reaction Factories! – McM 26.10-11

PEPTIDES**Ser-Ala Dipeptide****Ser-Ala-Asp Tripeptide**

Primary (1°) Structure →

Secondary (2°) Structure →

Tertiary (3°) Structure →

Quaternary (4°) Structure →

## **Enzymes**

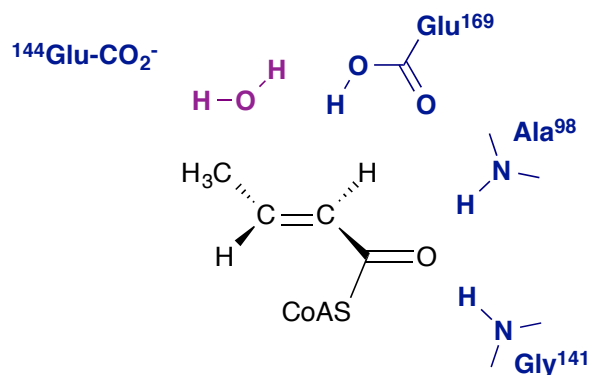
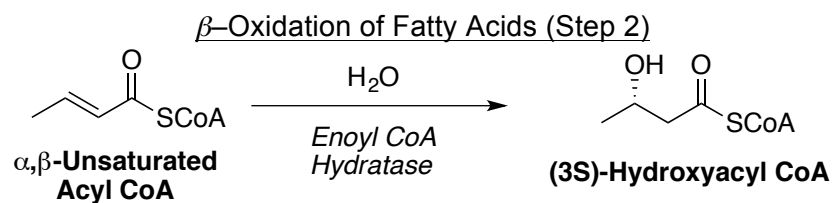
E or Enz = Enzyme; S = Substrate (Reactant); P = Product

### *Reactions Mechanisms & the Active Site*

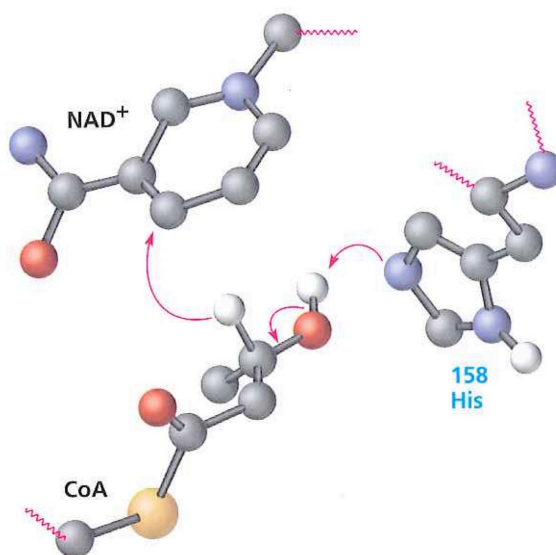
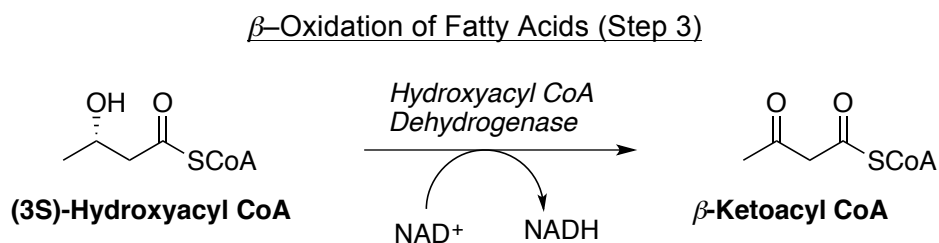
*Who's on the assembly line?*

- Amino acid residues (side chains)
  - Acids
  - Bases
  - Other
  
- Cofactors

## Active Site Example: Conjugate Addition of Water

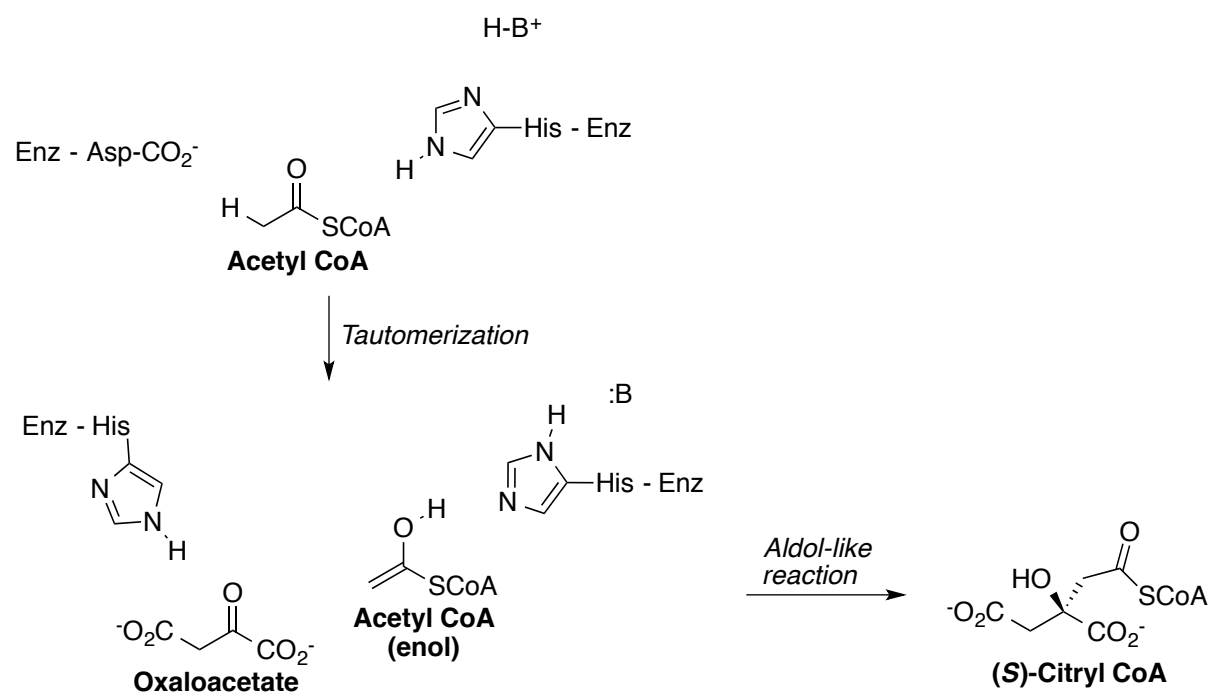


## Active Site Example: Oxidation of an Alcohol



**FIGURE 3.9** X-ray crystal structure of the enzyme–substrate complex from hydroxyacyl CoA dehydrogenase. His-158 deprotonates the hydroxyl group, and the adjacent hydride ion is transferred to NAD<sup>+</sup>.

## Active Site Example: Citrate Synthase (Citric Acid Cycle)

**Table 26.2 (McM)** Classification of Enzymes\*

Class	Some Subclasses	Function
Oxidoreductases	<i>Dehydrogenases</i> <i>Oxidases</i> <i>Reductases</i>	Introduction of double bond Oxidation Reduction
Transferases	<i>Kinases</i> <i>Transaminase</i>	Phosphate transfer Amino transfer
Hydrolases	<i>Lipases</i> <i>Nucleases</i> <i>Proteases</i>	Ester hydrolysis Phosphate hydrolysis Amide hydrolysis
Lyases	<i>Decarboxylases</i> <i>Dehydrases</i>	Loss of CO <sub>2</sub> Loss of H <sub>2</sub> O
Isomerases	<i>Epimerases</i>	Isomerization of chiral center
Ligases	<i>Carboxylases</i> <i>Synthetases</i>	Addition of CO <sub>2</sub> Formation of new bond

\*You are not expected to memorize these, but they can be useful clues in determining the type of reaction take place since most names are pretty self-explanatory!