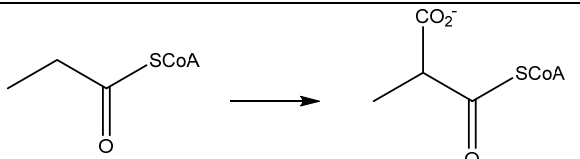
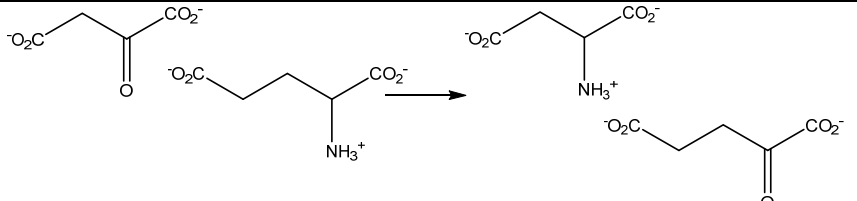
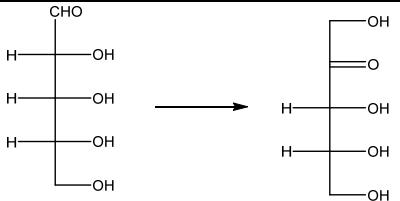
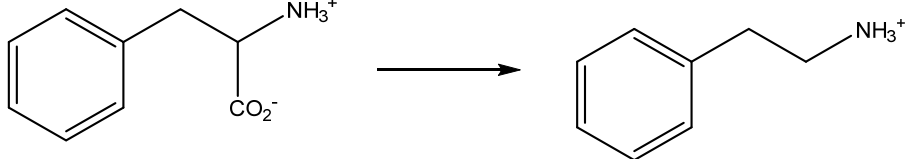
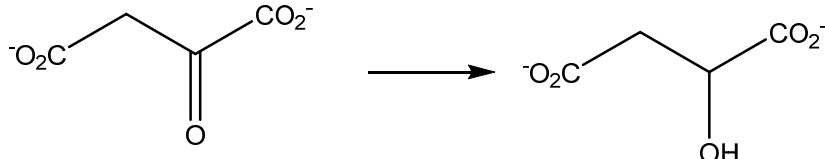
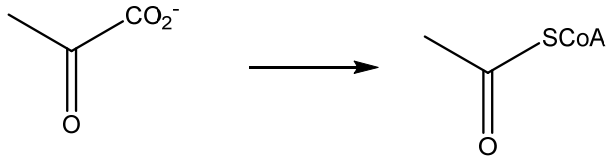
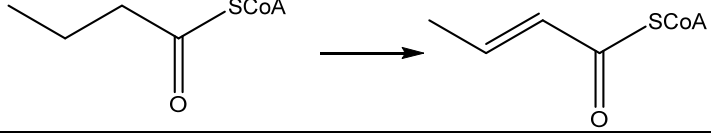
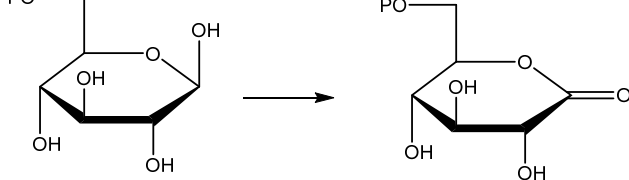


Discussion Exercise 12: Cofactors

Skill 1: Predict need for cofactor and ATP given a reaction

- Recognize the need for a cofactor (see table 6.2)
 - Biotin
 - carboxylation
 - TPP
 - Decarboxylation of α -ketoacid
 - Transketalase
 - PLP—reactions of α carbon of amino acids
 - Decarboxylation of amino acids
 - Racemization of amino acids
 - Transamination
 - THF
 - One carbon transfer
 - Coenzyme A
 - Thioester formation
 - NAD⁺/NADH
 - Redox of alcohol/carbonyl
 - FAD/FADH₂; Q/QH₂
 - Redox of alkane/alkene
- Recognize need for ATP: forming good leaving groups/high energy bonds
 - Carboxylases
 - Synthases
 - Many kinases

Problem: Fill in the table with the necessary cofactor, or write “no cofactor needed.” Does this reaction require ATP or produce ATP or neither?

Reaction	Cofactor?	ATP?
 <p>Reaction: Propionyl-CoA \rightarrow 2-methylpropionyl-CoA</p>		
 <p>Reaction: Oxaloacetate + Lysine \rightarrow Aspartate + Glutamate</p>		
 <p>Reaction: D-glucose \rightarrow D-fructose</p>		
 <p>Reaction: Phenylalanine \rightarrow Ethylamine</p>		
 <p>Reaction: Oxaloacetate \rightarrow Malate</p>		
 <p>Reaction: Pyruvate \rightarrow Acetyl-CoA</p>		
 <p>Reaction: Acetyl-CoA \rightarrow Crotonyl-CoA</p>		
 <p>Reaction: D-glucose-6-phosphate \rightarrow 6-phosphogluconate</p>		

For a good review, think about which pathway each reaction comes from.