



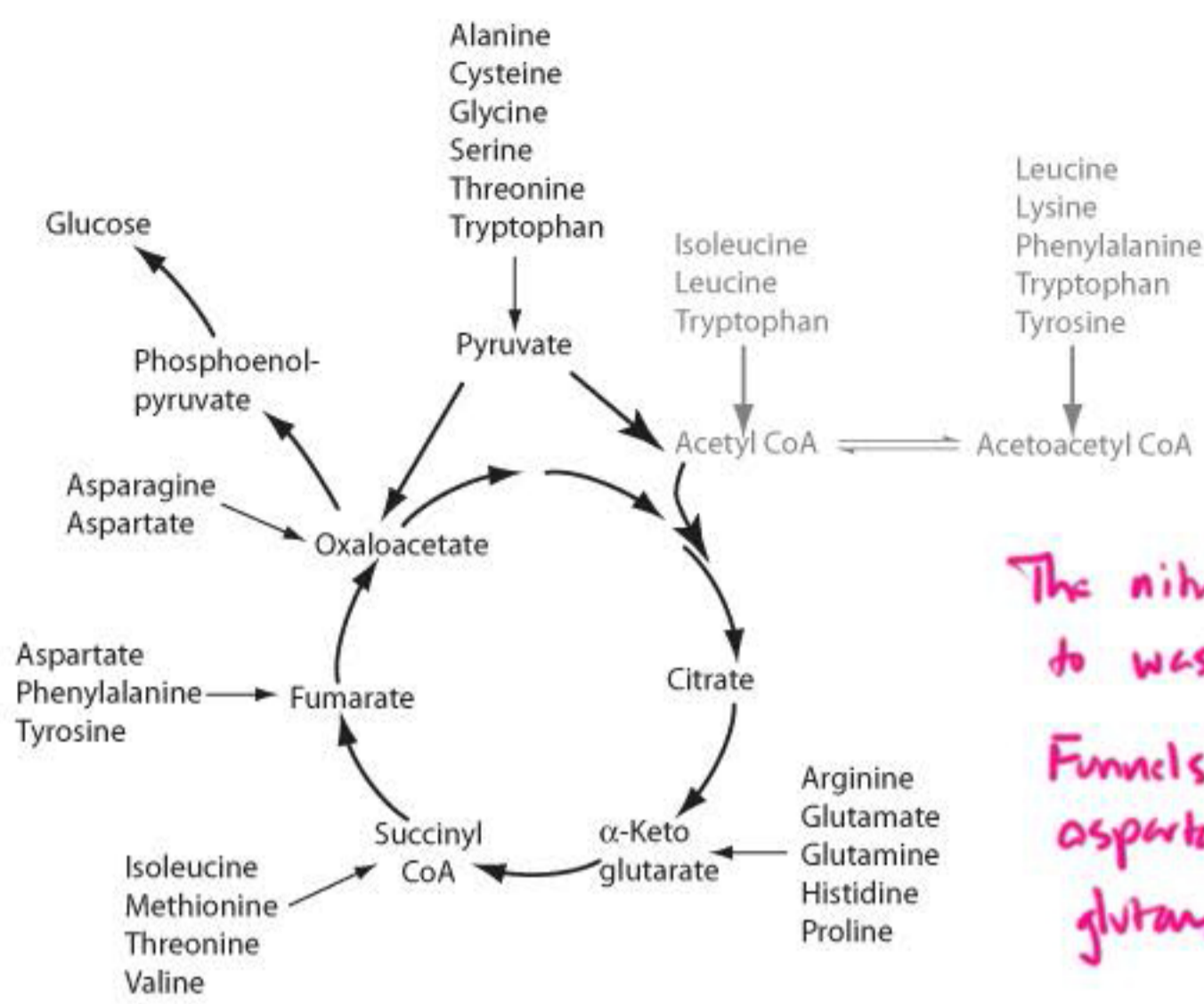
# Module 12

# Urea Cycle

## Session Slides with Notes

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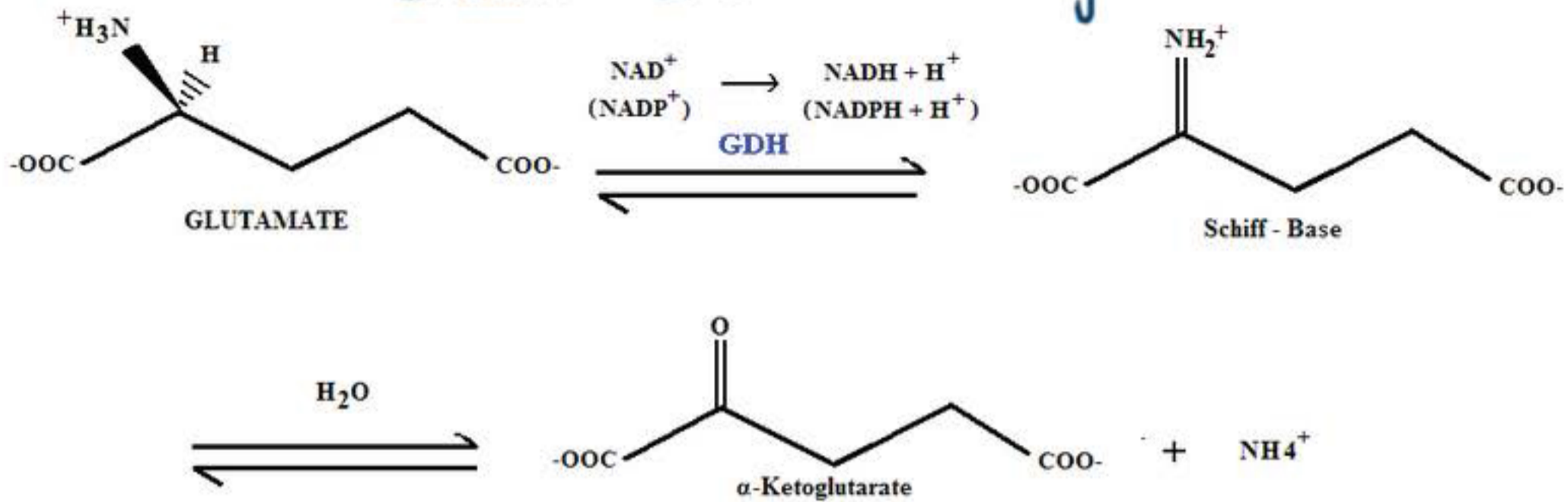




The nitrogen flows  
 to waste.

Funnel into  
 aspartate and  
 glutamate  
 ↓  
 urea cycle

# oxidative decarboxylation of glutamate

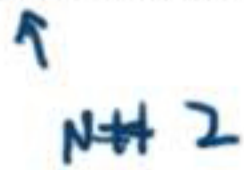
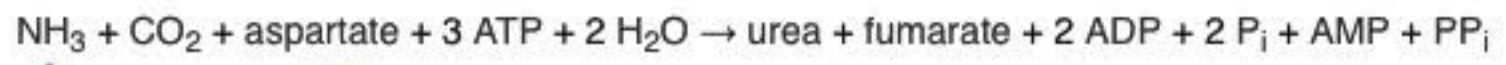
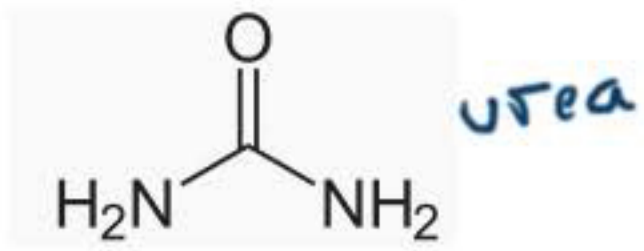


$\Delta G^\circ \oplus$

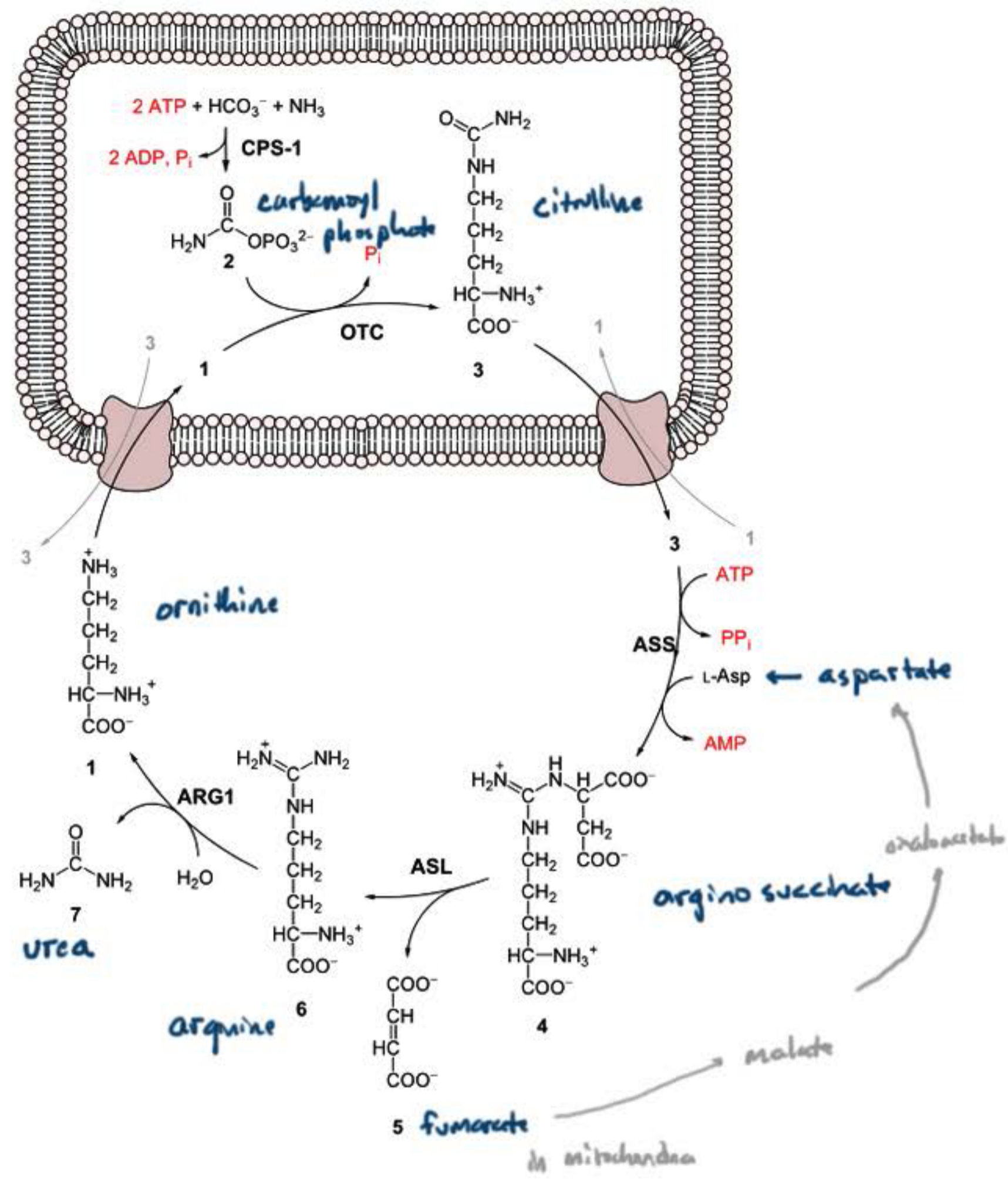
$\Delta G \ominus$  at physiological  $[\text{NH}_4^+]$

$\Delta G = \Delta G^\circ + RT \ln Q$

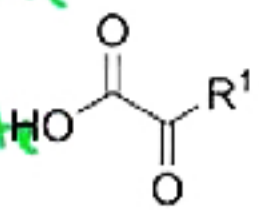
↓  
product removal



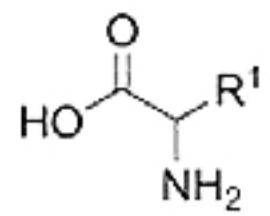
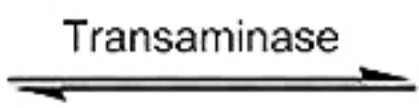
# Urea cycle



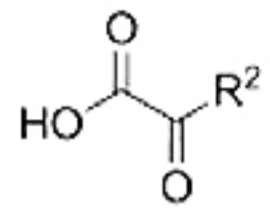
$\alpha$  keto glutarate  
or  
oxaloacetate



+

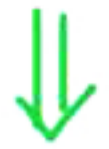


+

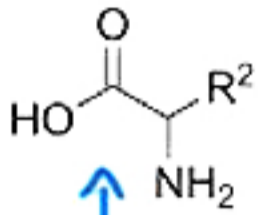


$\alpha$  keto acid

glutamate  
or  
aspartate

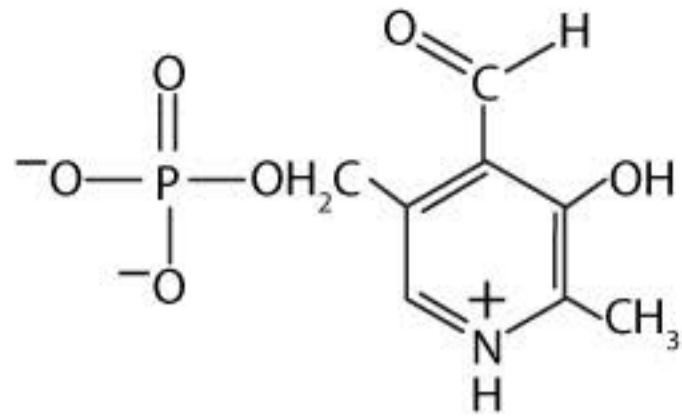


urea cycle

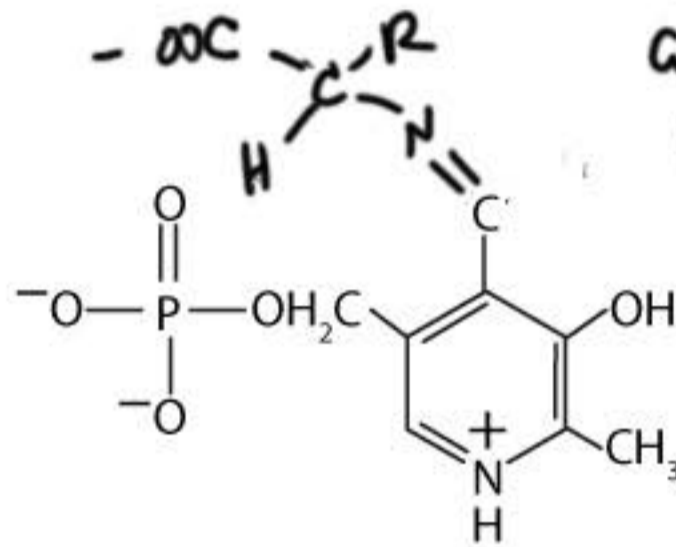


↑  
amino acid  
for food

Transaminase is  
a PLP  
enzyme

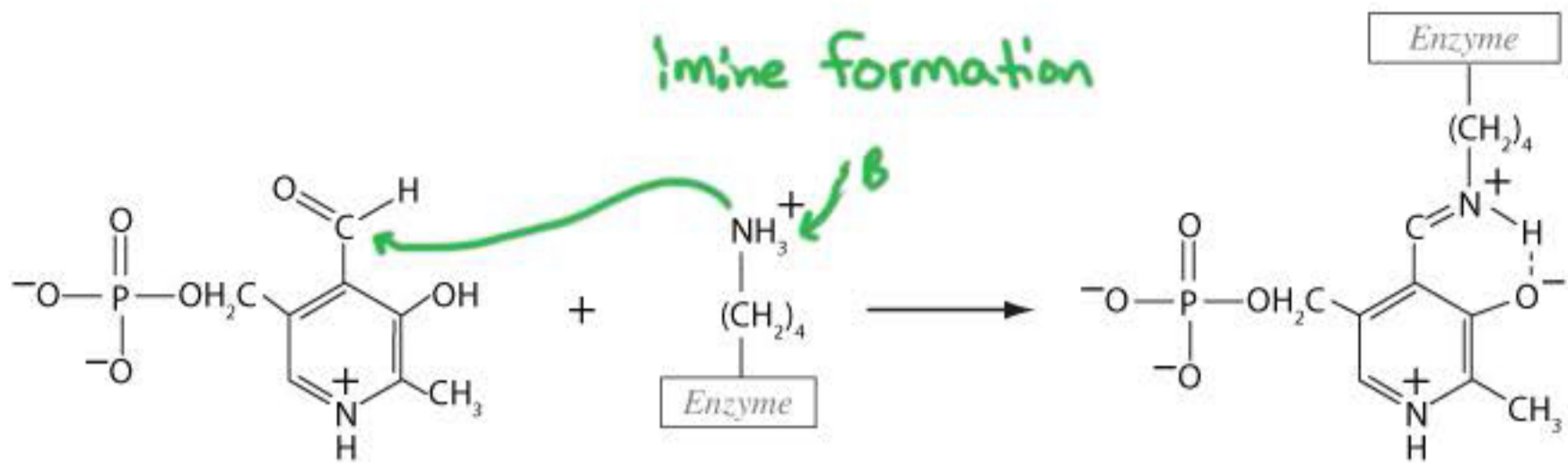


PLP  
amino acid  
Schiff base



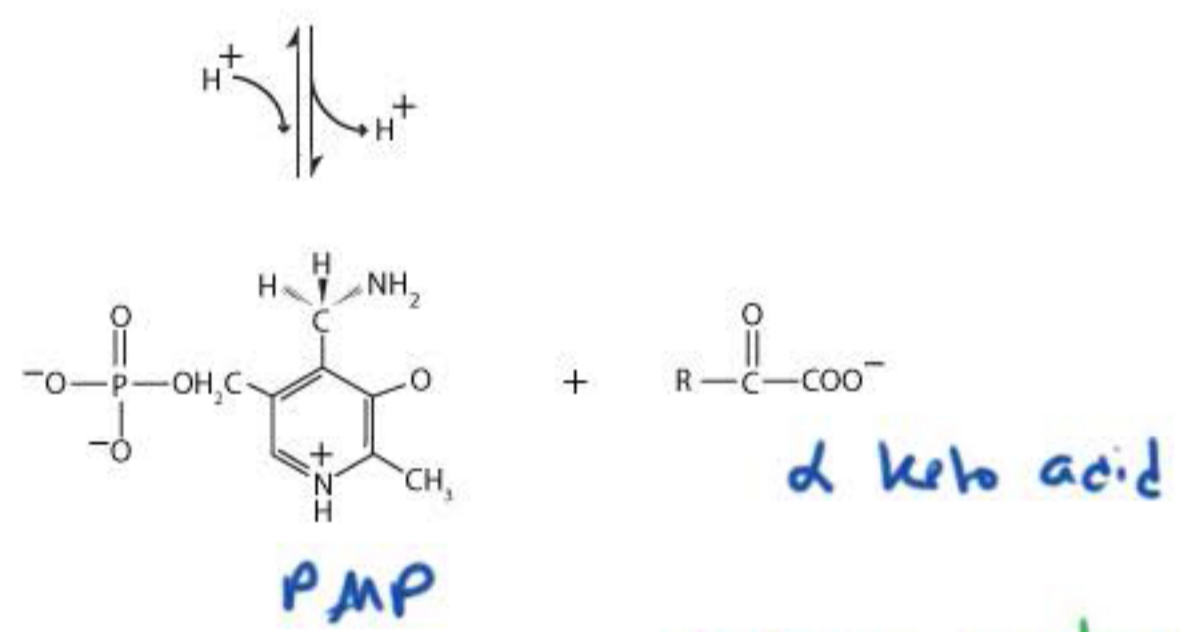
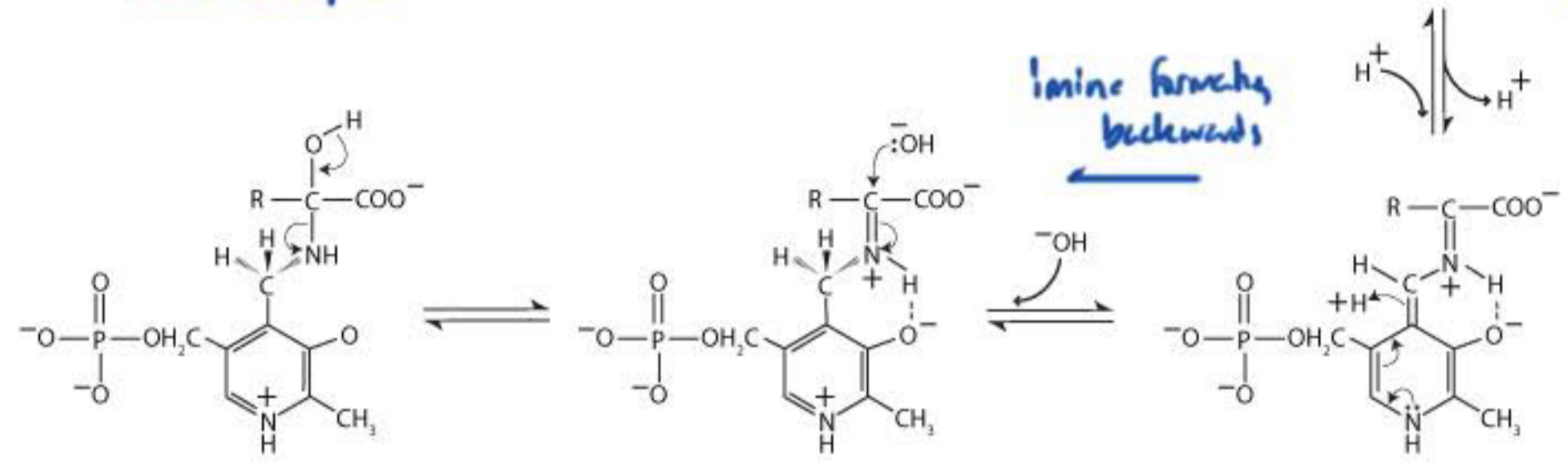
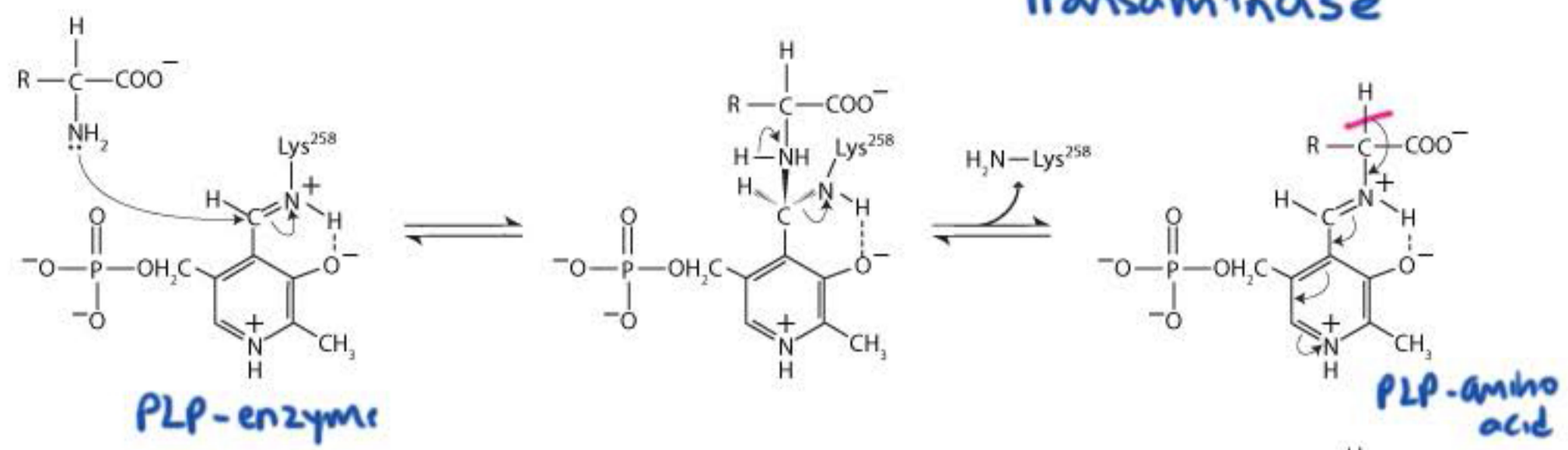
# Formation of PLP-enzyme Schiff base

Imine formation





# Transaminase



Next, we go backwards with a different  $\alpha$  keto acid.