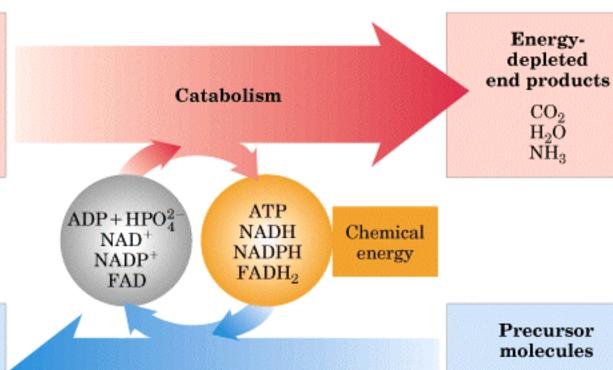


Figure 2-35 Molecular Biology of the Cell (© Garland Science 2008)

### Energycontaining nutrients

Carbohydrates Fats Proteins



### Cell macromolecules

Proteins Polysaccharides Lipids Nucleic acids

### Anabolism

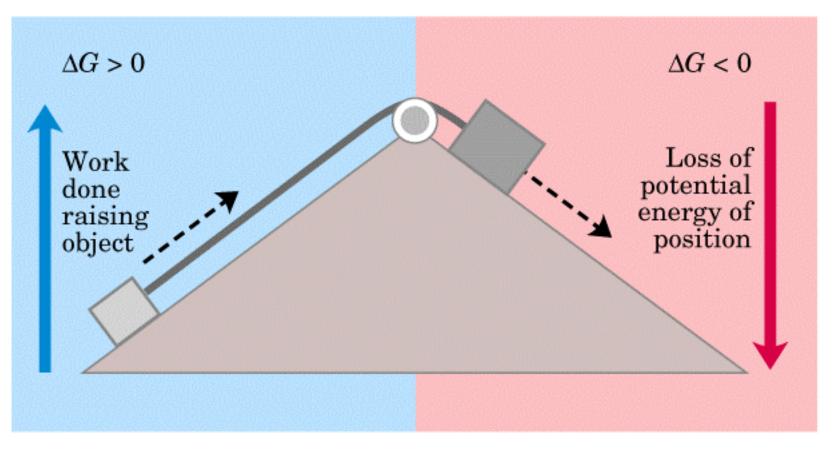
### Precursor molecules

Energydepleted

 $\begin{array}{c} \rm CO_2 \\ \rm H_2O \\ \rm NH_3 \end{array}$ 

Amino acids Sugars Fatty acids Nitrogenous bases

## (a) Mechanical example



Endergonic

Exergonic \_\_\_\_

$$\Delta G'^{\circ} = -RT \ln K'_{\mathrm{eq}}$$

# <u>table 14-3</u>

# Relationships among $K'_{eq}$ , $\Delta G'^{\circ}$ , and the Direction of Chemical Reactions under Standard Conditions

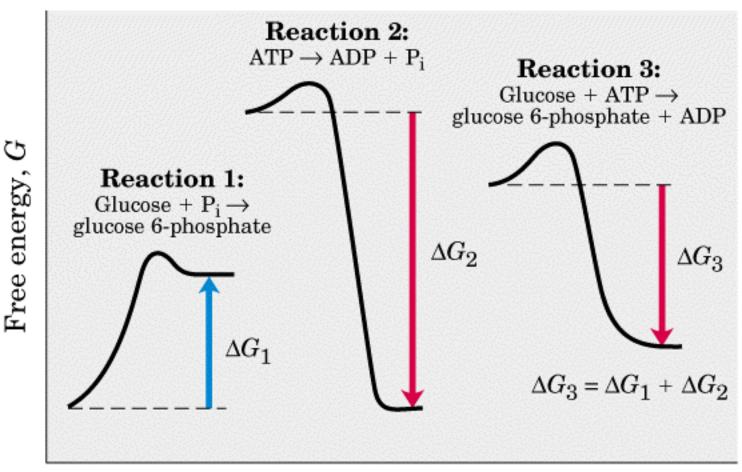
When $K_{\mathrm{eq}}'$ is	$\Delta G^{\prime\circ}$ is	Starting with 1 M components the reaction
>1.0	Negative	Proceeds forward
1.0	Zero	Is at equilibrium
<1.0	Positive	Proceeds in reverse

 $(1) A \longrightarrow B \Delta G_1^{\circ}$ 

(2)  $\rightarrow$  C  $\Delta G_2^{\circ}$ 

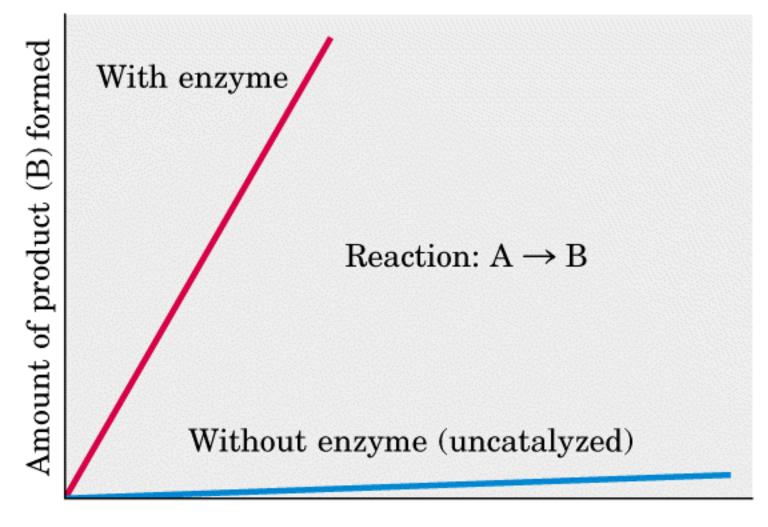
Sum: A  $\longrightarrow$  C  $\Delta G_1^{\circ}$  +  $\Delta G_2^{\circ}$ 

## (b) Chemical example

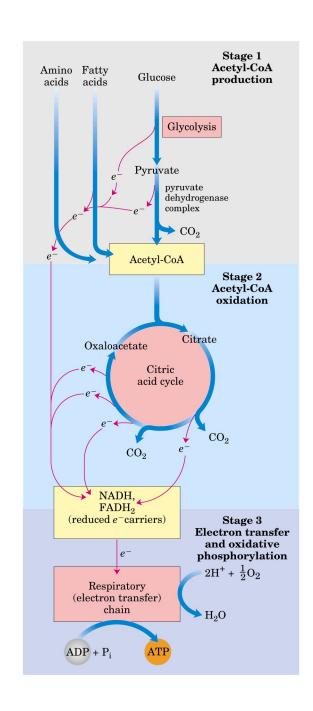


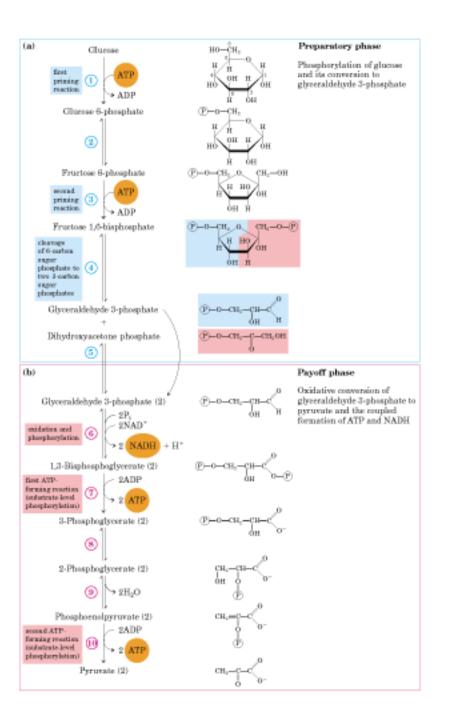
Reaction coordinate

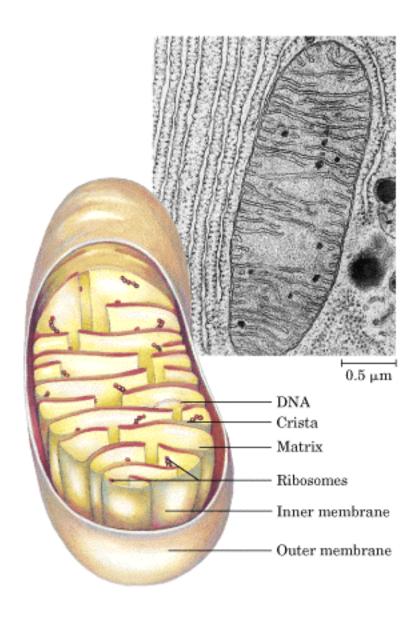
Reaction coordinate  $(A \rightarrow B)$ 

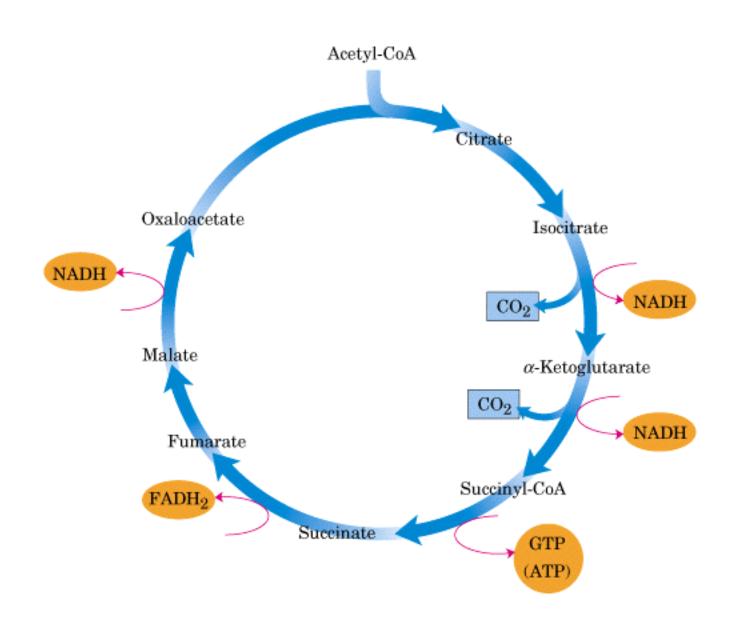


Time









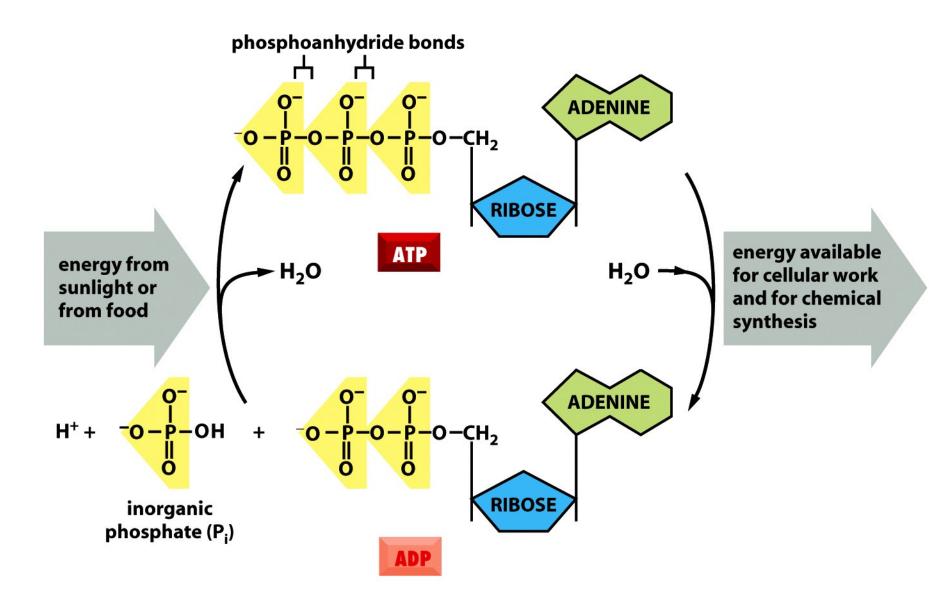
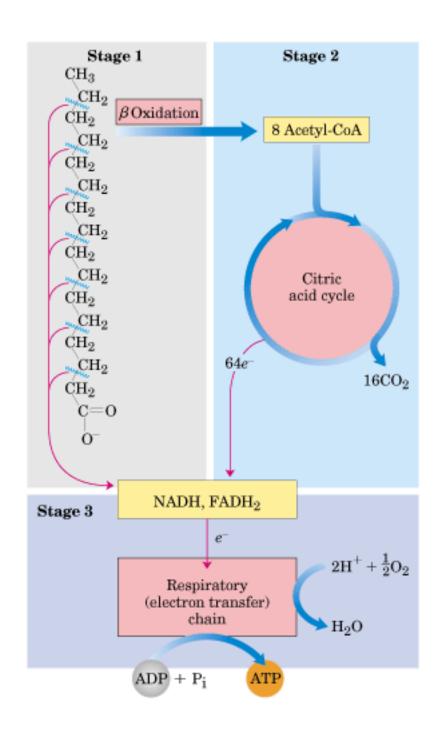
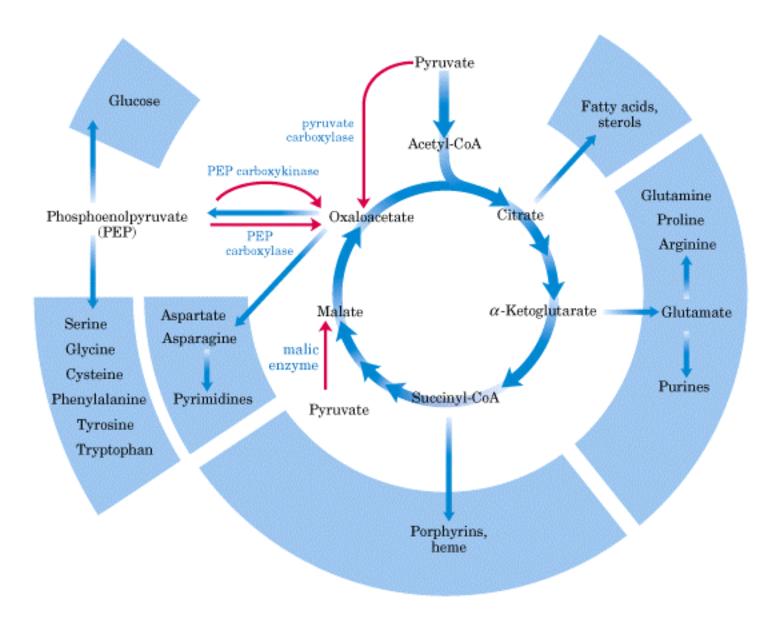


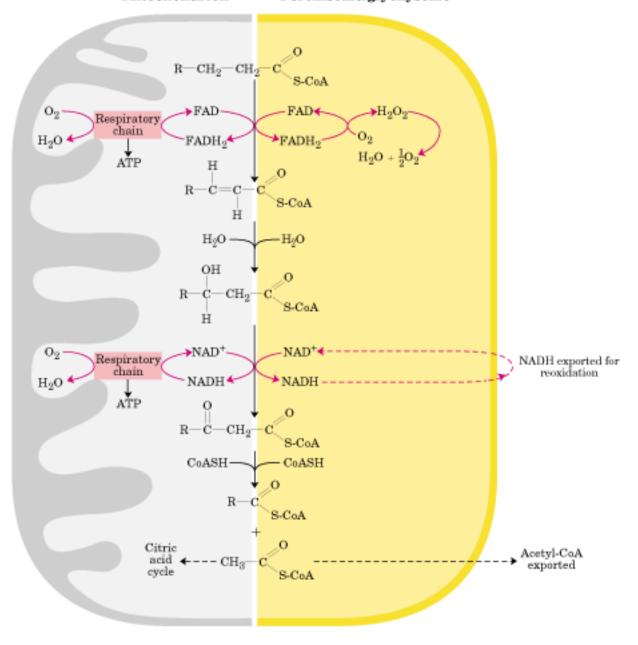
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### Mitochondrion

### Peroxisome/glyoxysome



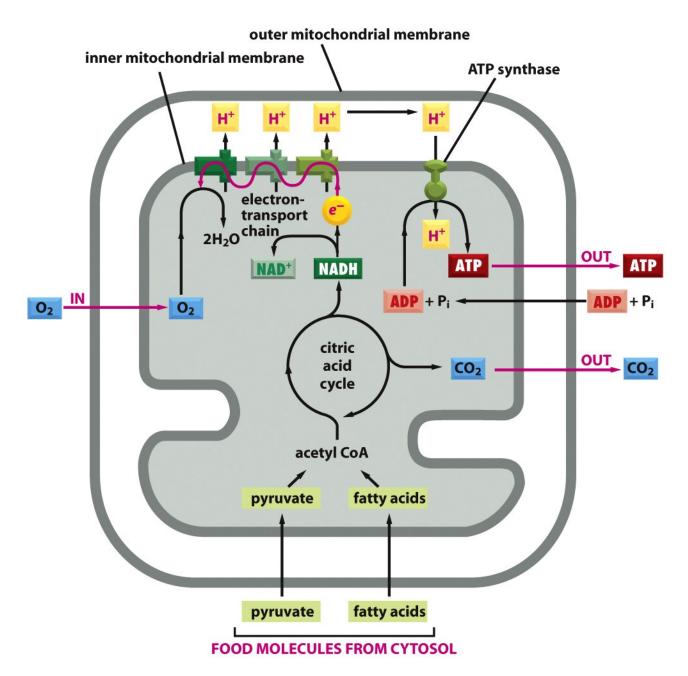
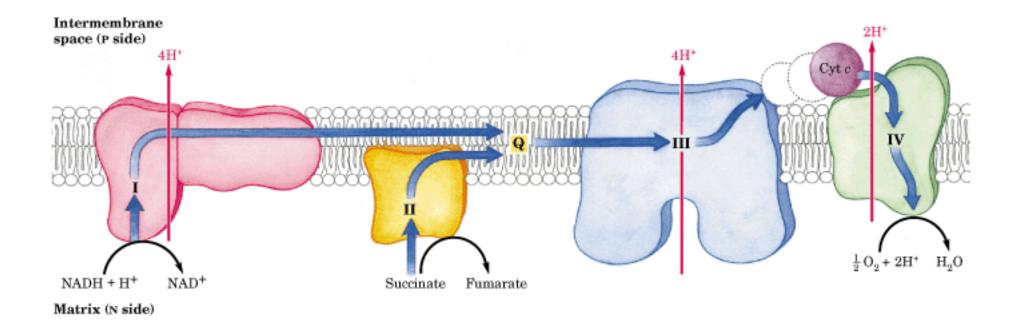


Figure 14-10 Molecular Biology of the Cell (© Garland Science 2008)



### **MITOCHONDRION**

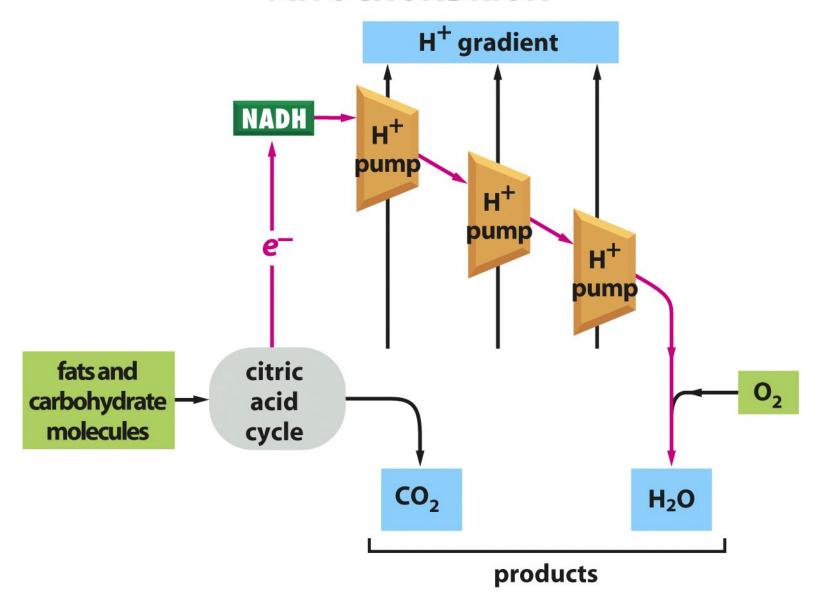


Figure 14-3a Molecular Biology of the Cell (© Garland Science 2008)

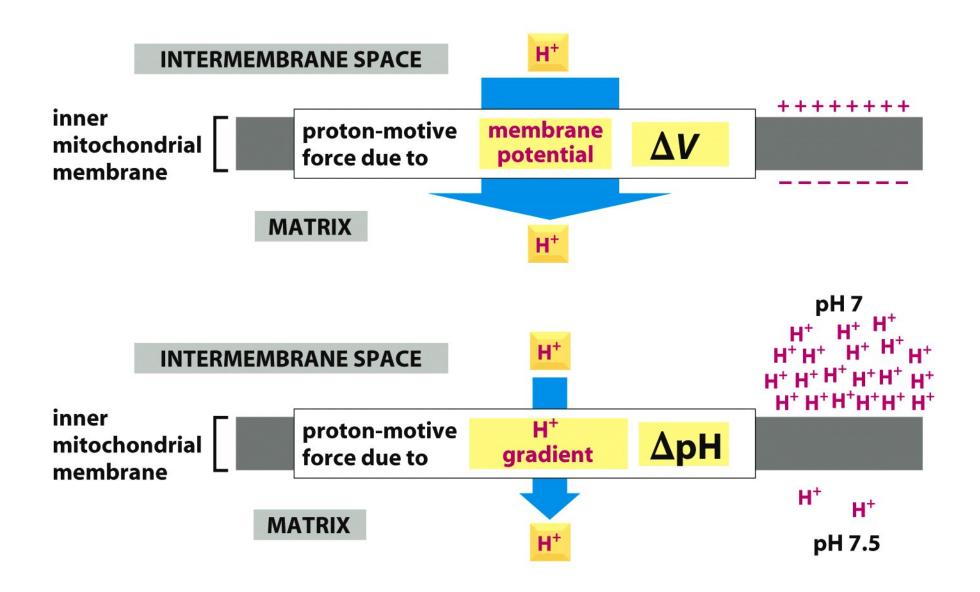
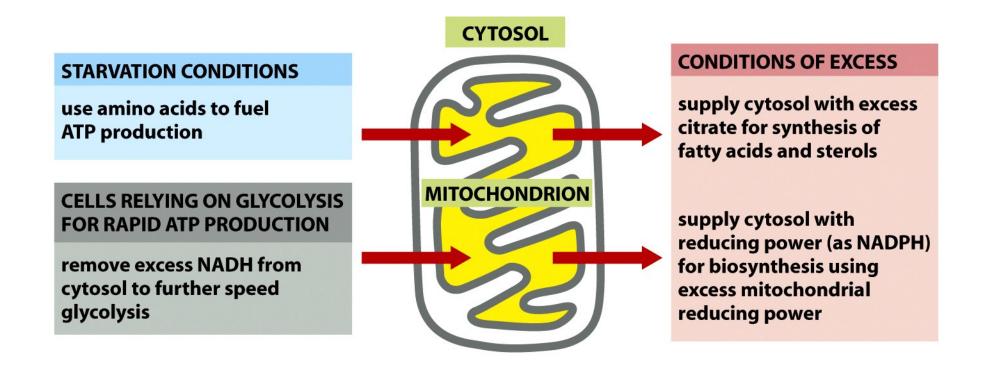
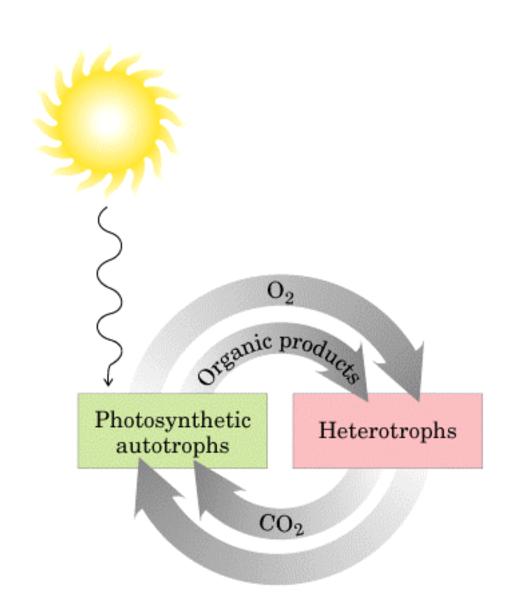


Figure 14-13 Molecular Biology of the Cell (© Garland Science 2008)





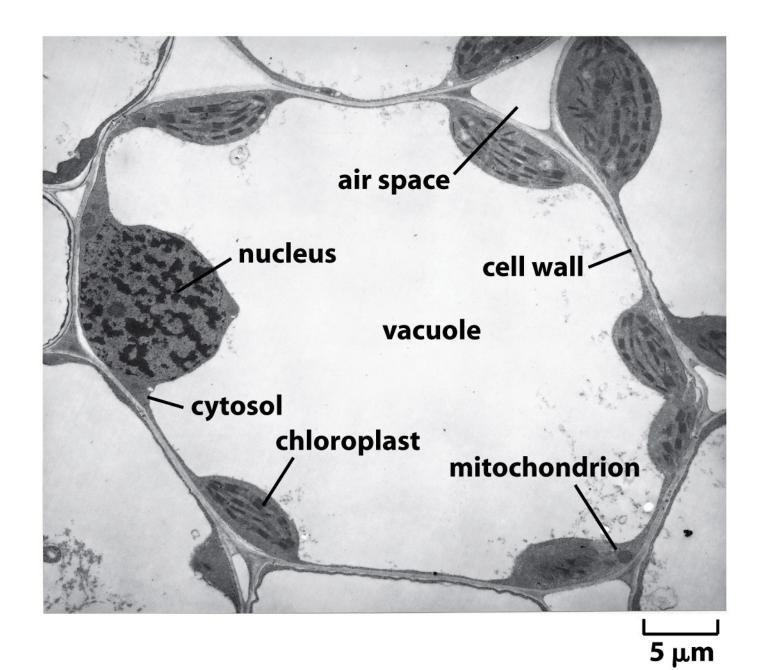


Figure 14-35a Molecular Biology of the Cell (© Garland Science 2008)

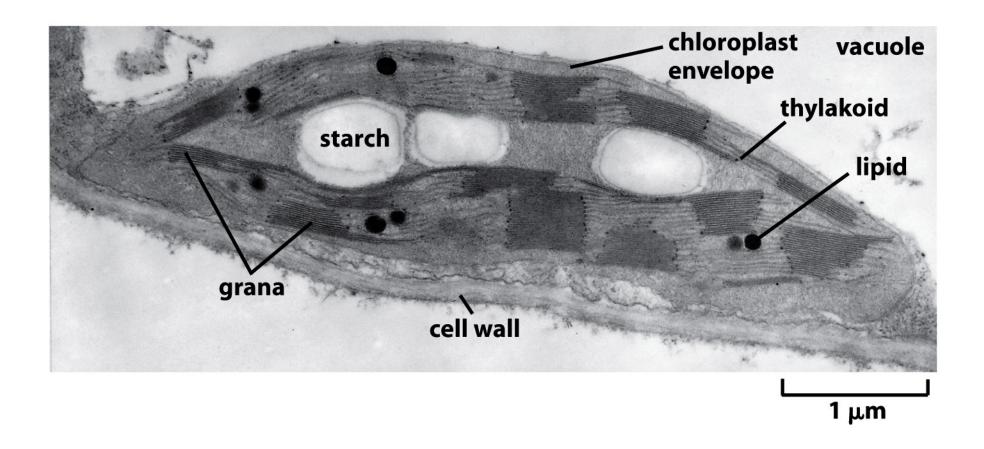


Figure 14-35b Molecular Biology of the Cell (© Garland Science 2008)

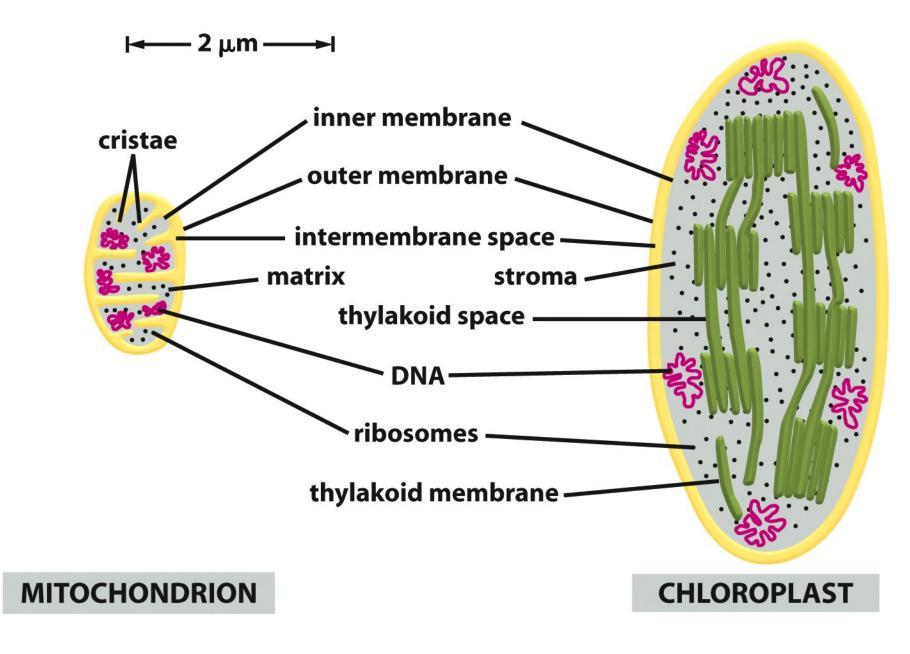


Figure 14-37 Molecular Biology of the Cell (© Garland Science 2008)

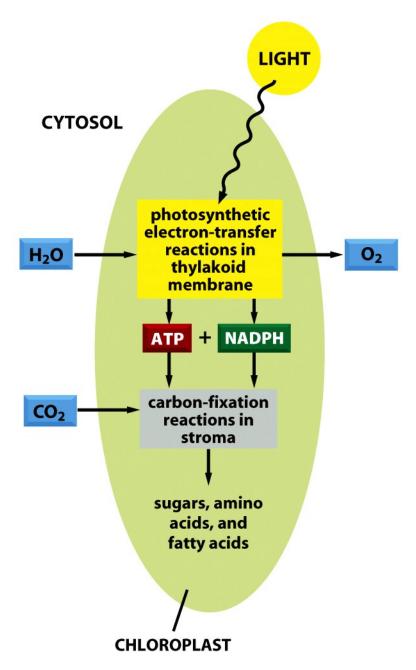


Figure 14-38 Molecular Biology of the Cell (© Garland Science 2008)

## **CHLOROPLAST**

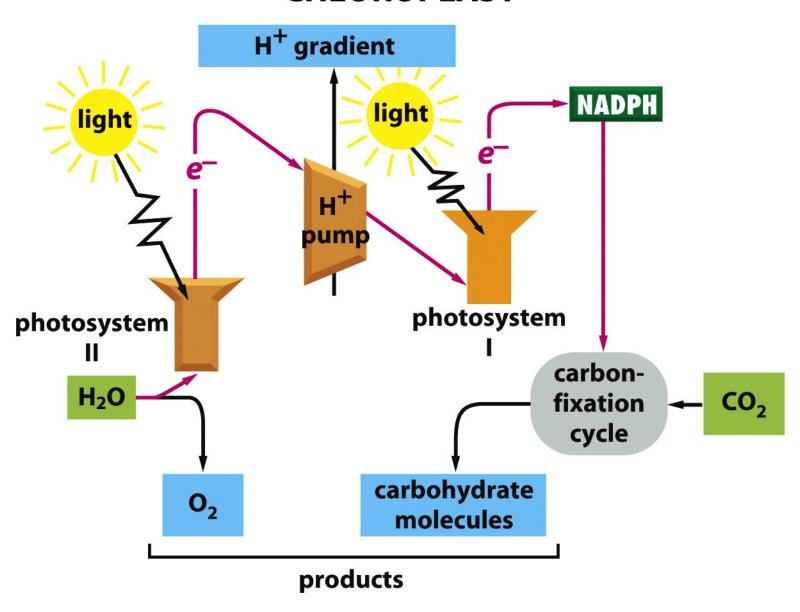


Figure 14-3b Molecular Biology of the Cell (© Garland Science 2008)

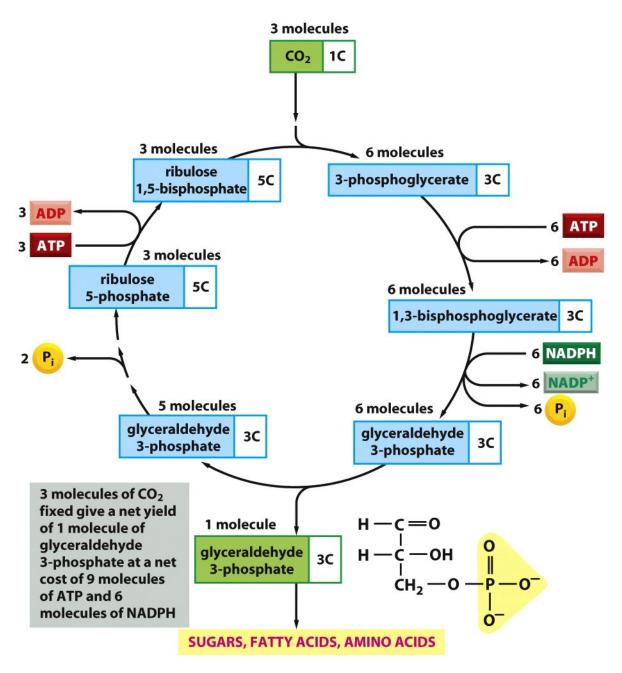


Figure 14-40 Molecular Biology of the Cell (© Garland Science 2008)

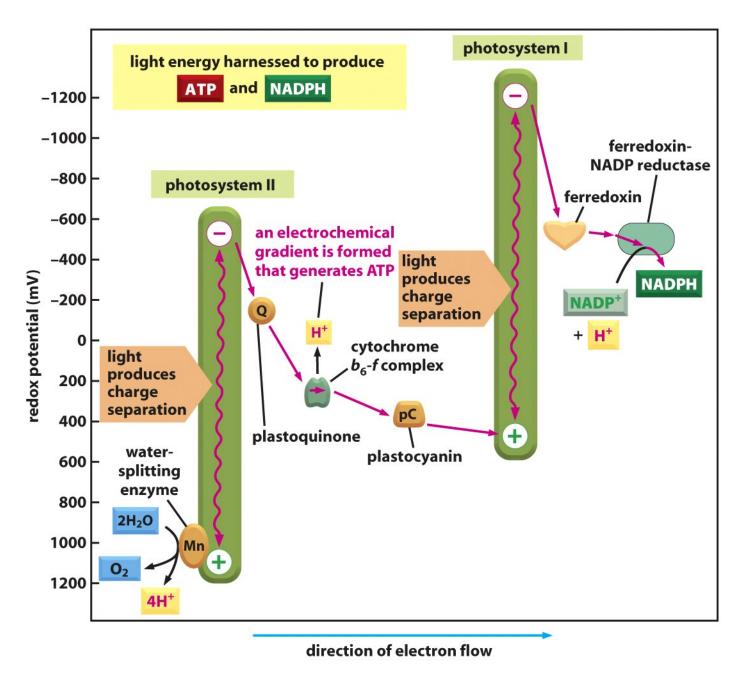


Figure 14-49 Molecular Biology of the Cell (© Garland Science 2008)