Figure 6-2 Cell and Molecular Biology, 4/e (© 2005 John Wiley & Sons)
Monogalactosyl diacylglycerol
Photosynthesis

Chloroplast

CO₂ + H₂O → ATP

NADPH

ADP + NADP⁺ → Sun

Light energy

H₂O → O₂

(contains low-energy electrons)

Aerobic respiration

Mitochondrion

CO₂ + H₂O → NAD⁺ + chemical energy (ATP)

NADH

H₂O → O₂

(contains high-energy electrons)

Carbohydrate

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Figure 6-6  Cell and Molecular Biology, 4/e (© 2005 John Wiley & Sons)
Chlorophyll $a$ vs. Action spectrum vs. $\beta$-carotene vs. Chlorophyll $b$ vs. Wavelength, nm

Relative light absorption and relative photochemical efficiency

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Figure 6-10 Cell and Molecular Biology, 4/e (© 2005 John Wiley & Sons)
Figure 6-12 Cell and Molecular Biology, 4/e (© 2005 John Wiley & Sons)
\[ S_0 \xrightarrow{hv} S_1 \xrightarrow{hv} S_2 \xrightarrow{hv} S_3 \xrightarrow{hv} S_4 \]

\[ 4H^+ + O_2 \rightarrow 2H_2O \]
Figure 6-13 Cell and Molecular Biology, 4/e (© 2005 John Wiley & Sons)
H\(^+\) + NADP\(^+\) \rightarrow NADPH

Ferredoxin
NADP\(^+\) reductase

Stroma

FLASH

LHC I

P700 Dimer

Thylakoid lumen

Plastocyanin

Figure 6-15 Cell and Molecular Biology, 4/e (© 2005 John Wiley & Sons)
Figure 6-18 Cell and Molecular Biology, 4/e (© 2005 John Wiley & Sons)
RuBP
(Ene-diol form)

Intermediate

3-PGA

Figure 6-19a Cell and Molecular Biology, 4/e (© 2005 John Wiley & Sons)
Calvin Cycle

1. RuBP carboxylase

2. \( \text{CH}_2\text{OPO}_3^- \)

3. \( \text{HCOH} \)

4. \( \text{CH}_2\text{OPO}_3^- \)

5. \( \text{6 Carboxylase intermediate} \)

6. \( \text{6 (CO}_2\text{)} \)

7. \( \text{6 (RuBP)} \)

8. \( \text{12 (PGA)} \)

9. \( \text{12 (BPG)} \)

10. \( \text{12 (GAP)} \)

11. \( \text{2 GAP} \rightarrow \text{Fructose} \rightarrow \text{Sucrose} \)

12. \( \text{12 ATP} \rightarrow \text{12 ADP + 12P}_i \)

13. \( \text{12 NADPH} \)

14. \( \text{12 P}_i \)

15. \( \text{12 NADP}^+ \)

Figure 6-19b Cell and Molecular Biology, 4/e (© 2005 John Wiley & Sons)
RuBP carboxylase

6 \text{(CO}_2\text{)}

6 \text{Carboxylase intermediate}

6 \text{(RuBP)}
6 Carboxylase intermediate

SPLITS

12 (PGA)

12 (BPG)

12 ATP

12 ADP + 12Pi

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