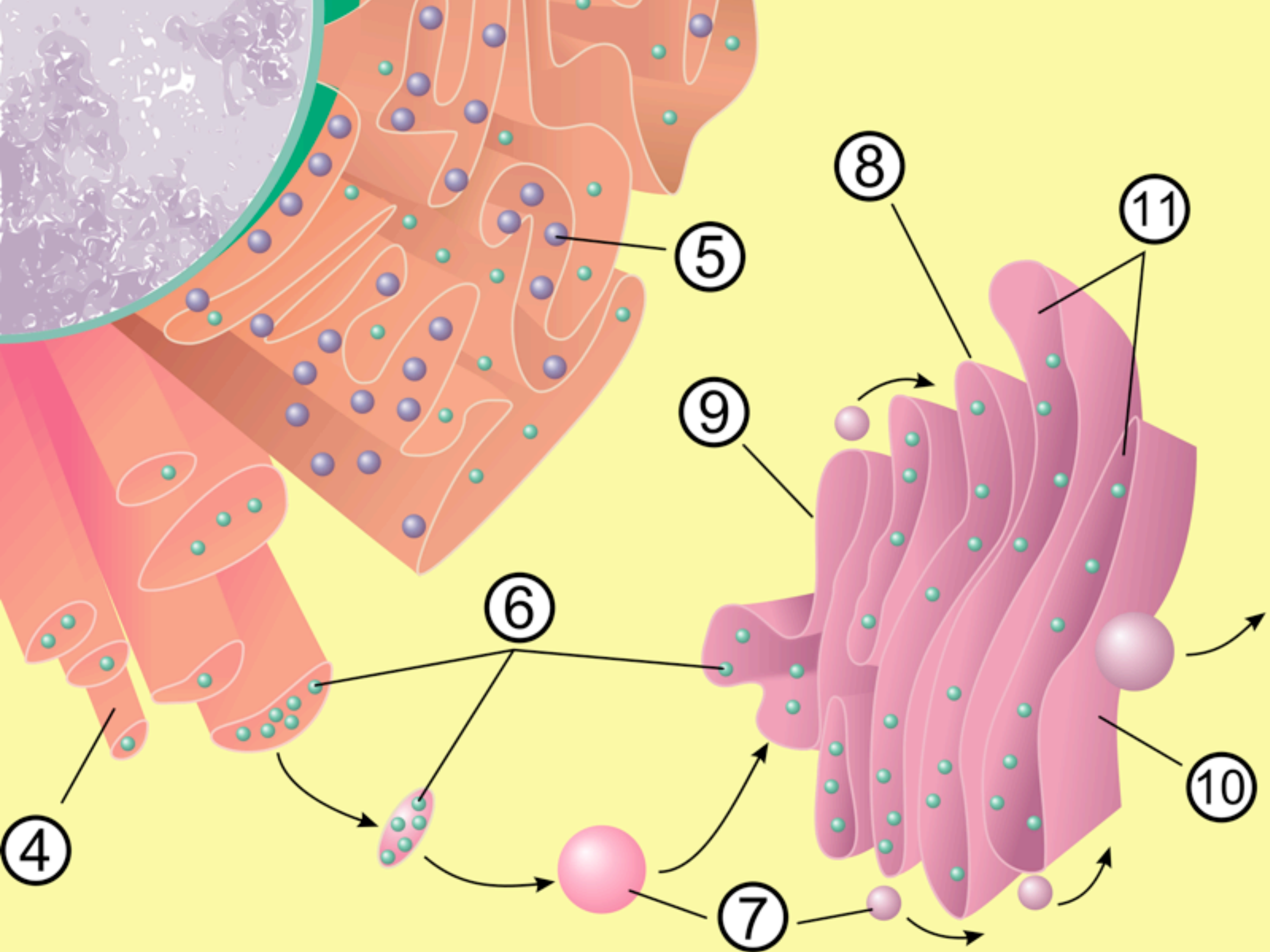
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Membrane Biochemistry

Lectures by

John F. Allen

School of Biological and Chemical Sciences, Queen Mary, University of London

jfallen.org/lectures

Queen Mary
University of London

Lectures by John F. Allen

Copies of materials and presentations

- Cell Biology and Developmental Genetics
- Membrane Biochemistry
- Membrane Proteins
- Inaugural lecture
- The Rudi Lemberg Lectures 2009

Other lectures

- Biomolecules of Life

Computer application programs, viewers, and readers. From external sites.

- Adobe Reader
- OpenOffice.org
- Quicktime Viewer

John F. Allen web page

Queen Mary
University of London

Lectures in Membrane Biochemistry

- The endomembrane system - endocytosis and exocytosis (Acrobat, .pdf file)
- The endomembrane system - vesicular transport and protein trafficking (Acrobat, .pdf file)

Course web pages

Membrane Biochemistry web pages

General reference

Cell and Molecular Biology: Concepts and Experiments
Gerald Karp. Fifth Edition 2008. John Wiley & Sons Inc.

The Endomembrane System

The Endomembrane System

Exocytosis and endocytosis

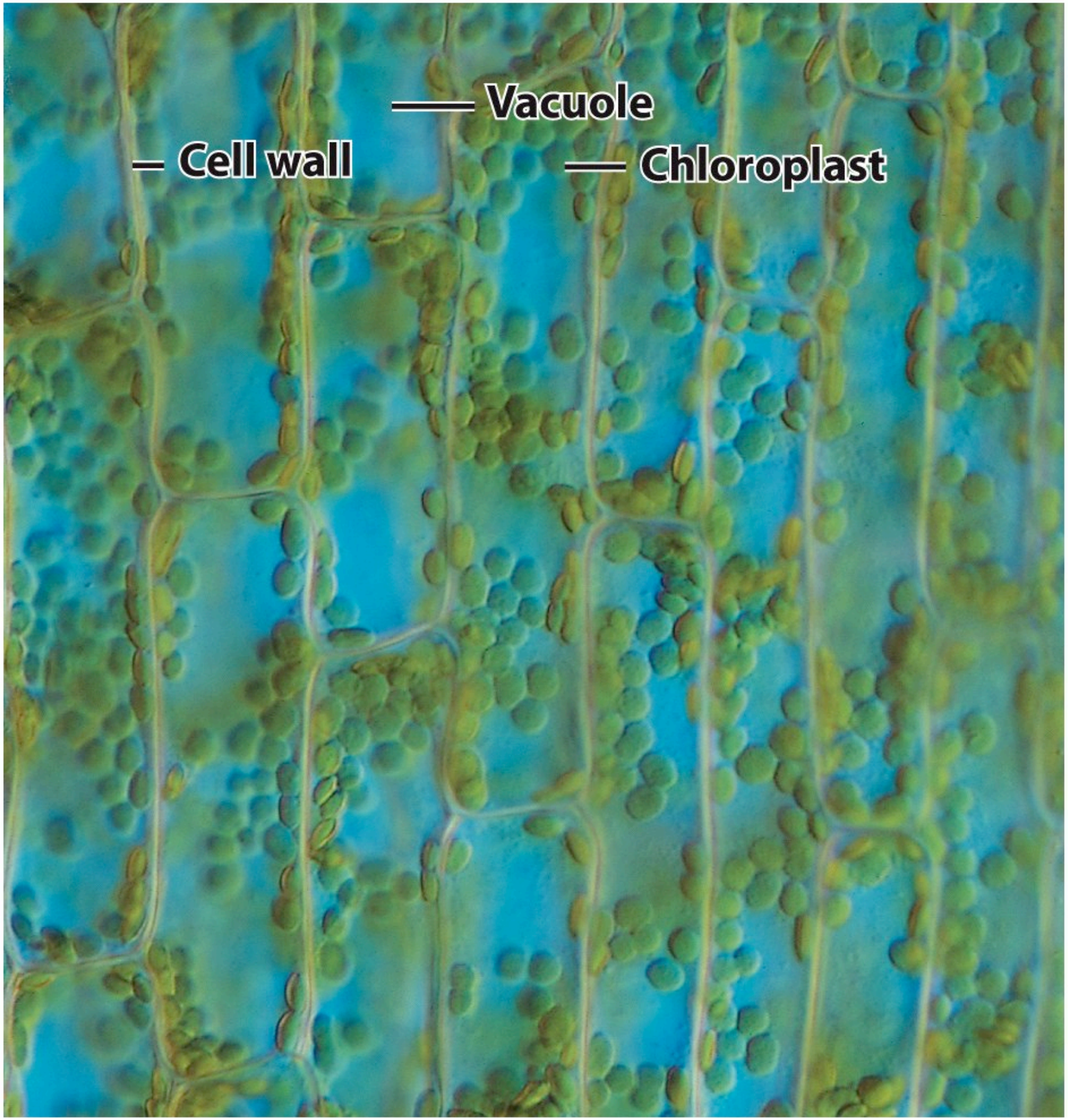
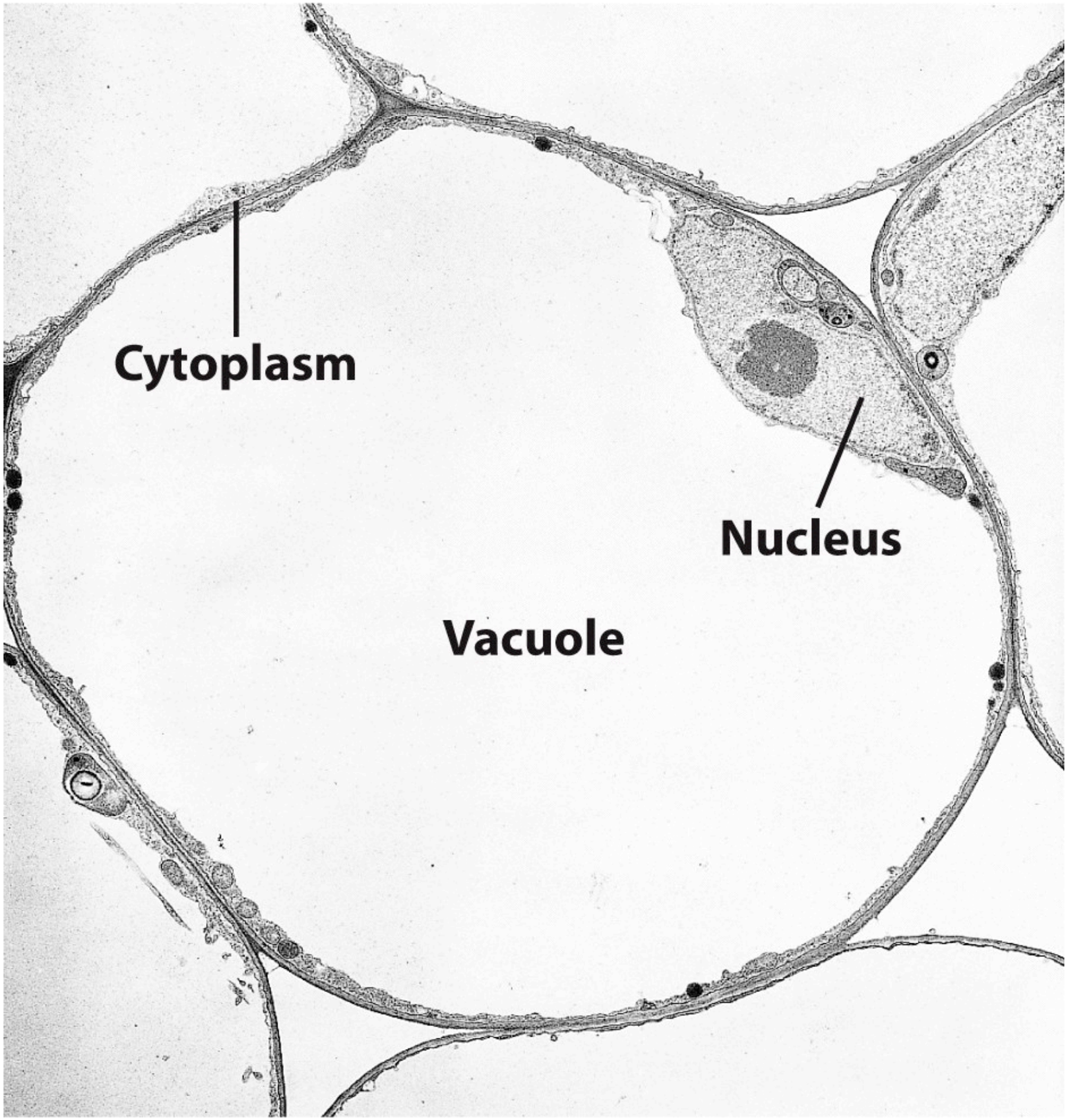


Figure 8-36a Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)



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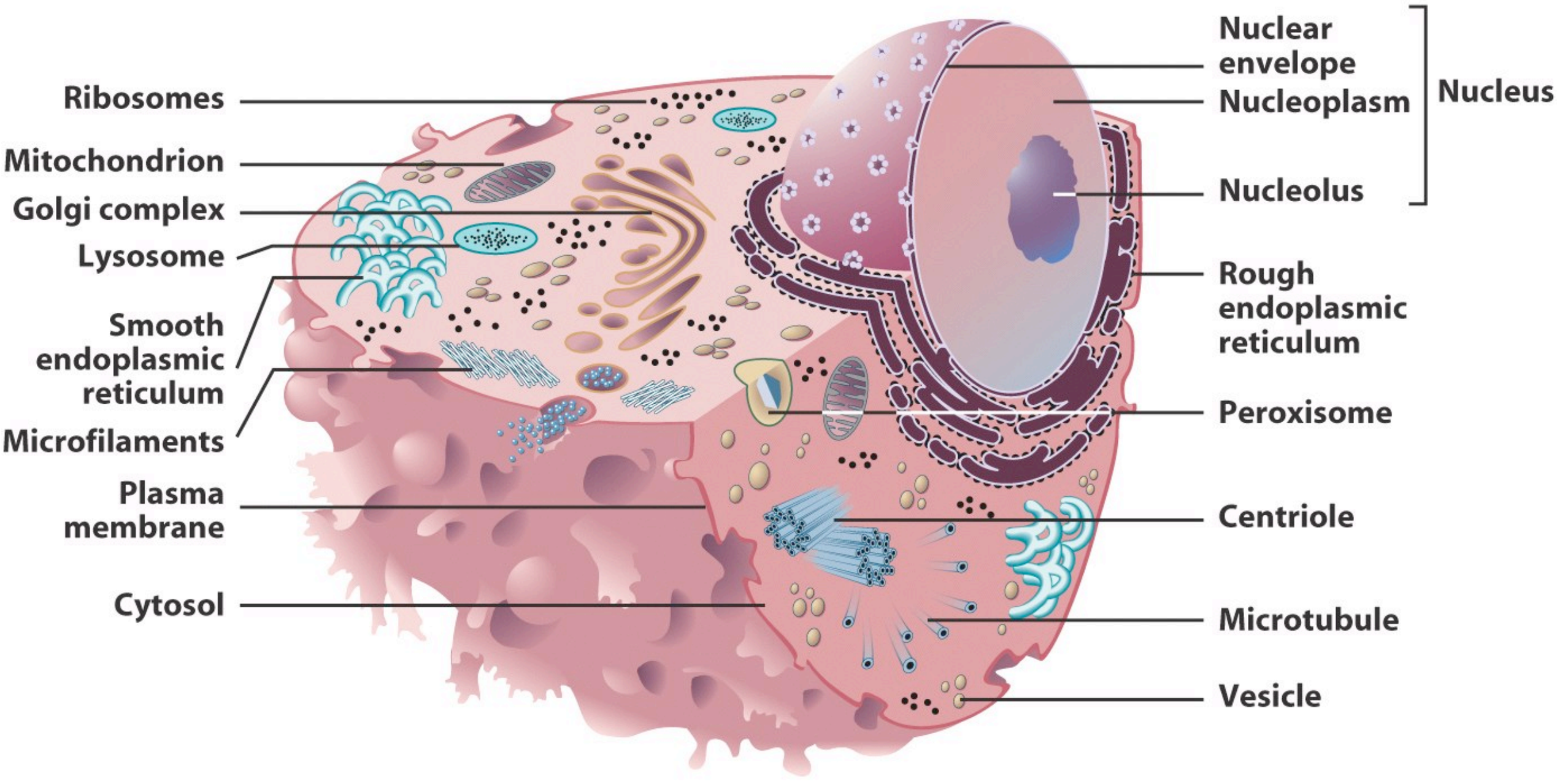


Figure 1-8c Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

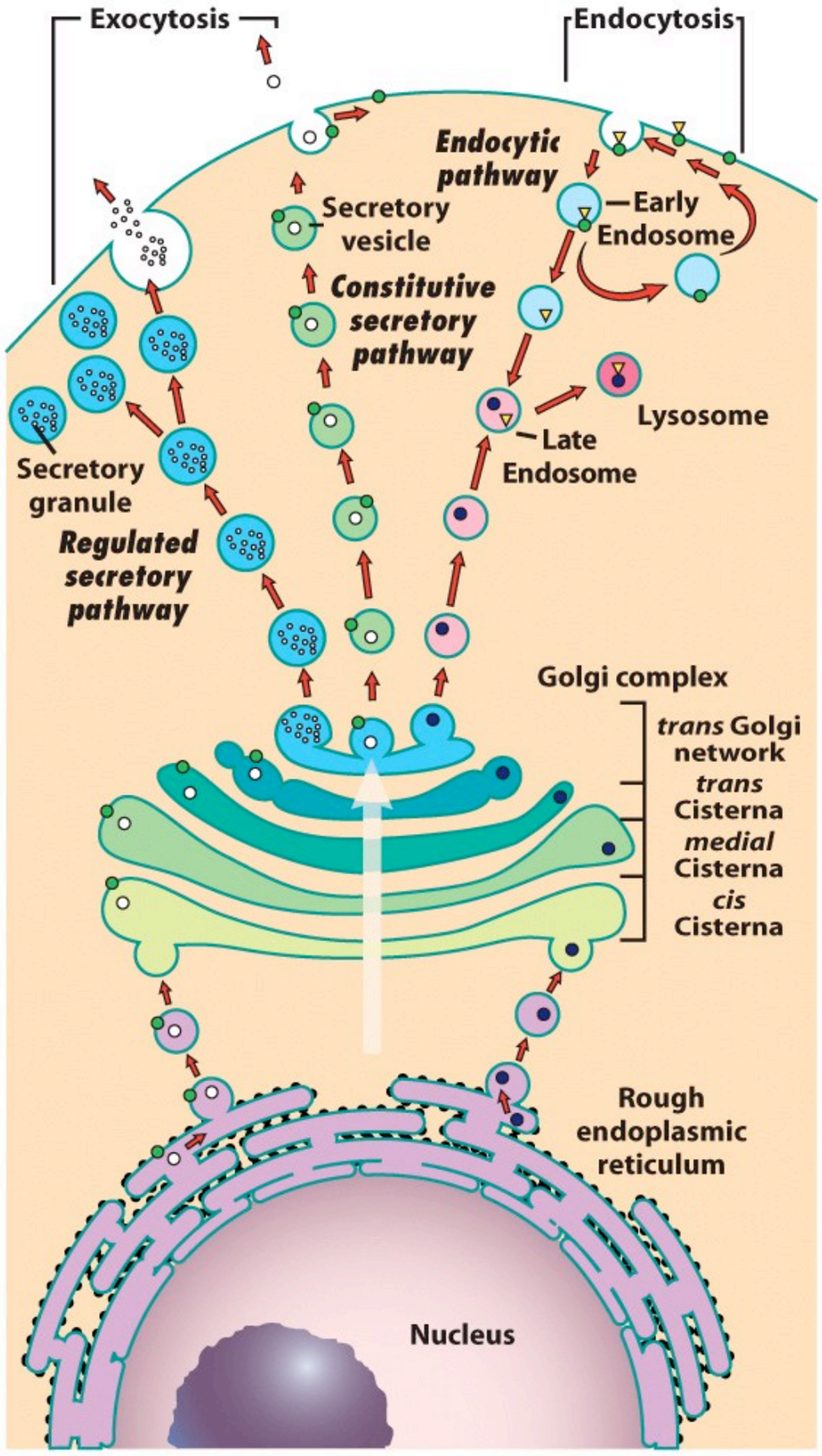


Figure 8-2b Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Figure 8.2 An overview of the biosynthetic/secretory and endocytic pathways that unite endomembranes into a dynamic, interconnected network.

Vesicular transport

Vesicular transport

Three types of coated vesicles

Vesicular transport

Three types of coated vesicles

COP I

Vesicular transport

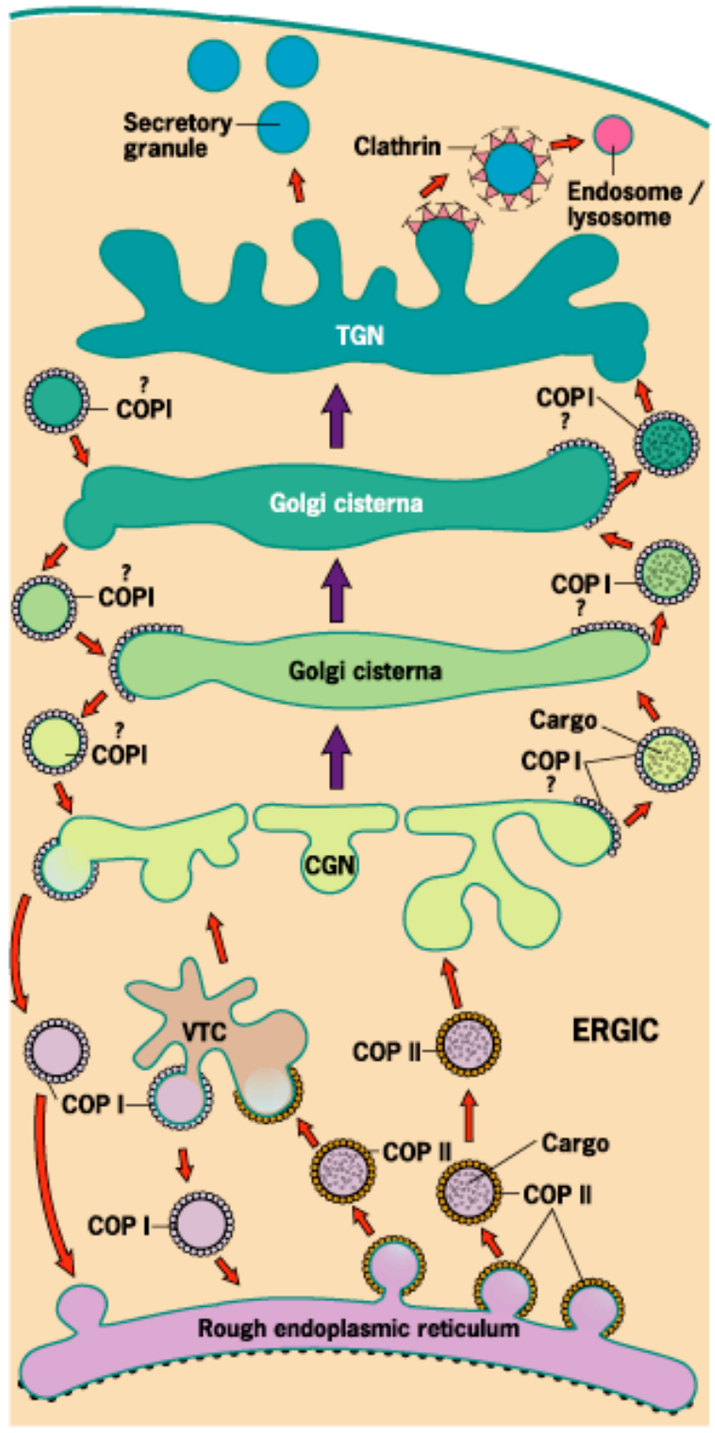
Three types of coated vesicles

COP I
COP II

Vesicular transport

Three types of coated vesicles

COP I
COP II
Clathrin-coated vesicles



(a)

Figure 8.25 Movement of materials by vesicular transport between membranous compartments of the biosynthetic/secretory pathway.

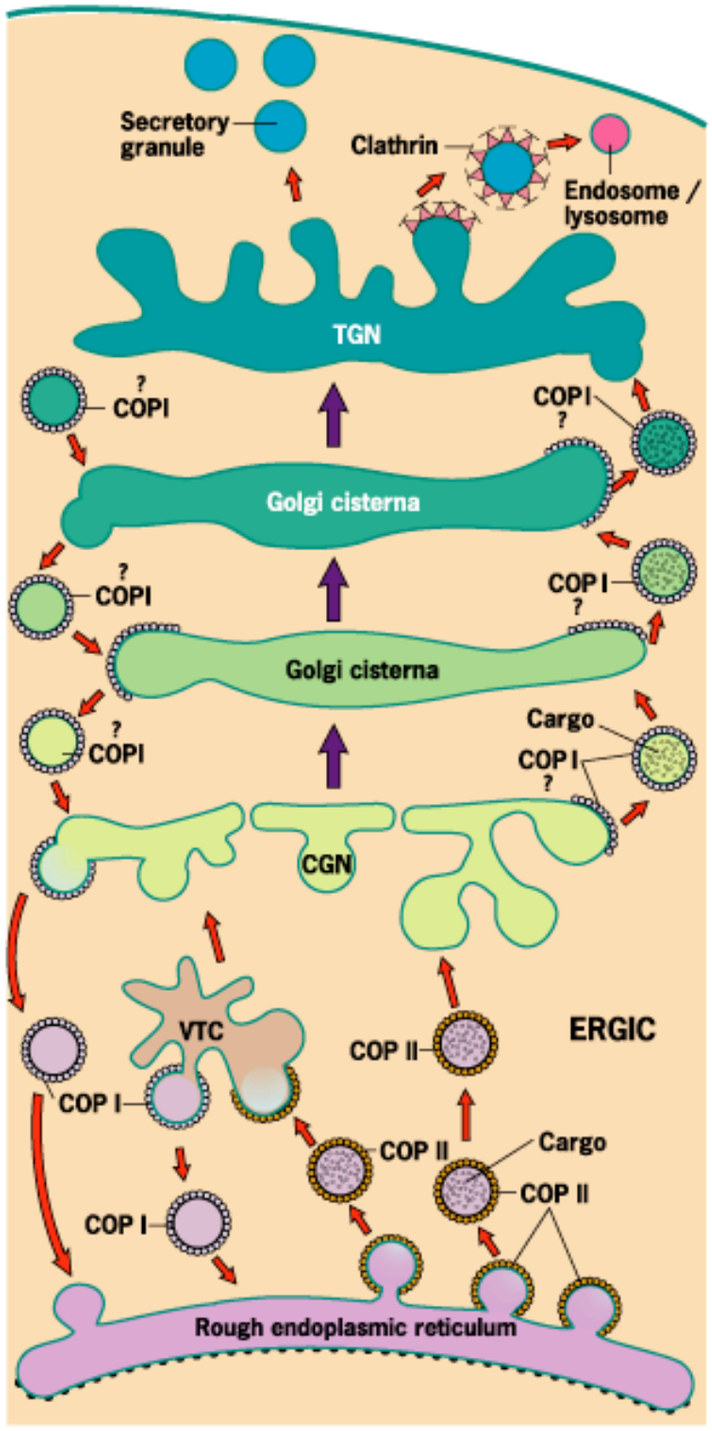


Figure 8.25 Movement of materials by vesicular transport between membranous compartments of the biosynthetic/secretory pathway.

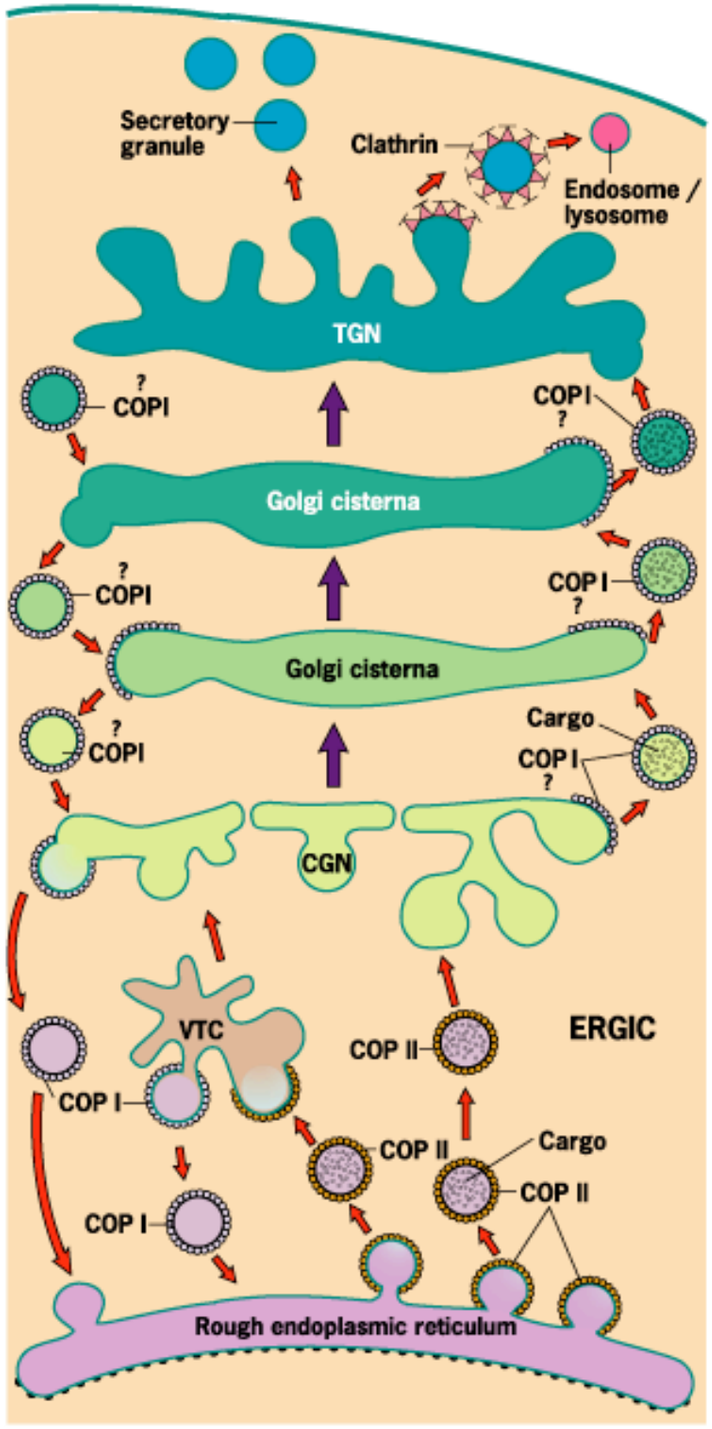


Figure 8.25 Movement of materials by vesicular transport between membranous compartments of the biosynthetic/secretory pathway.

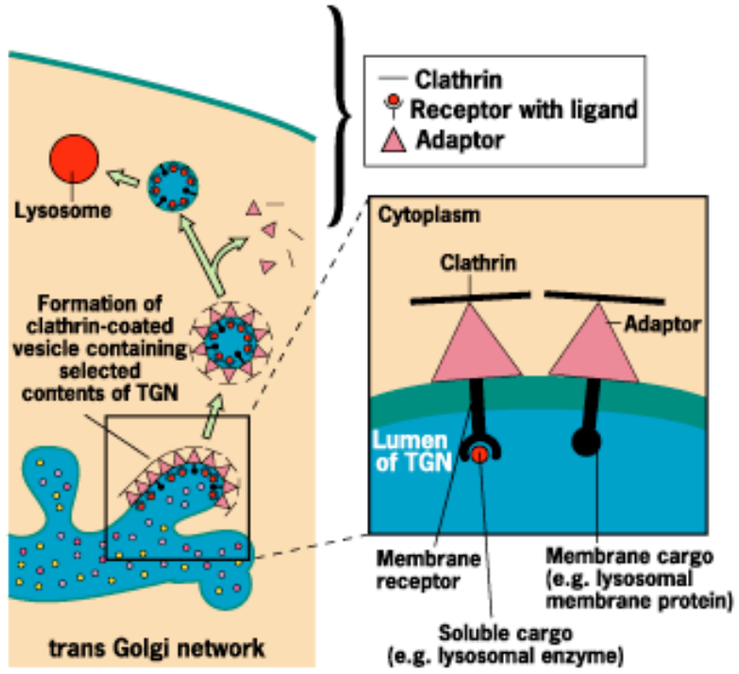


Figure 8.28 The formation of clathrin-coated vesicles at the TGN.

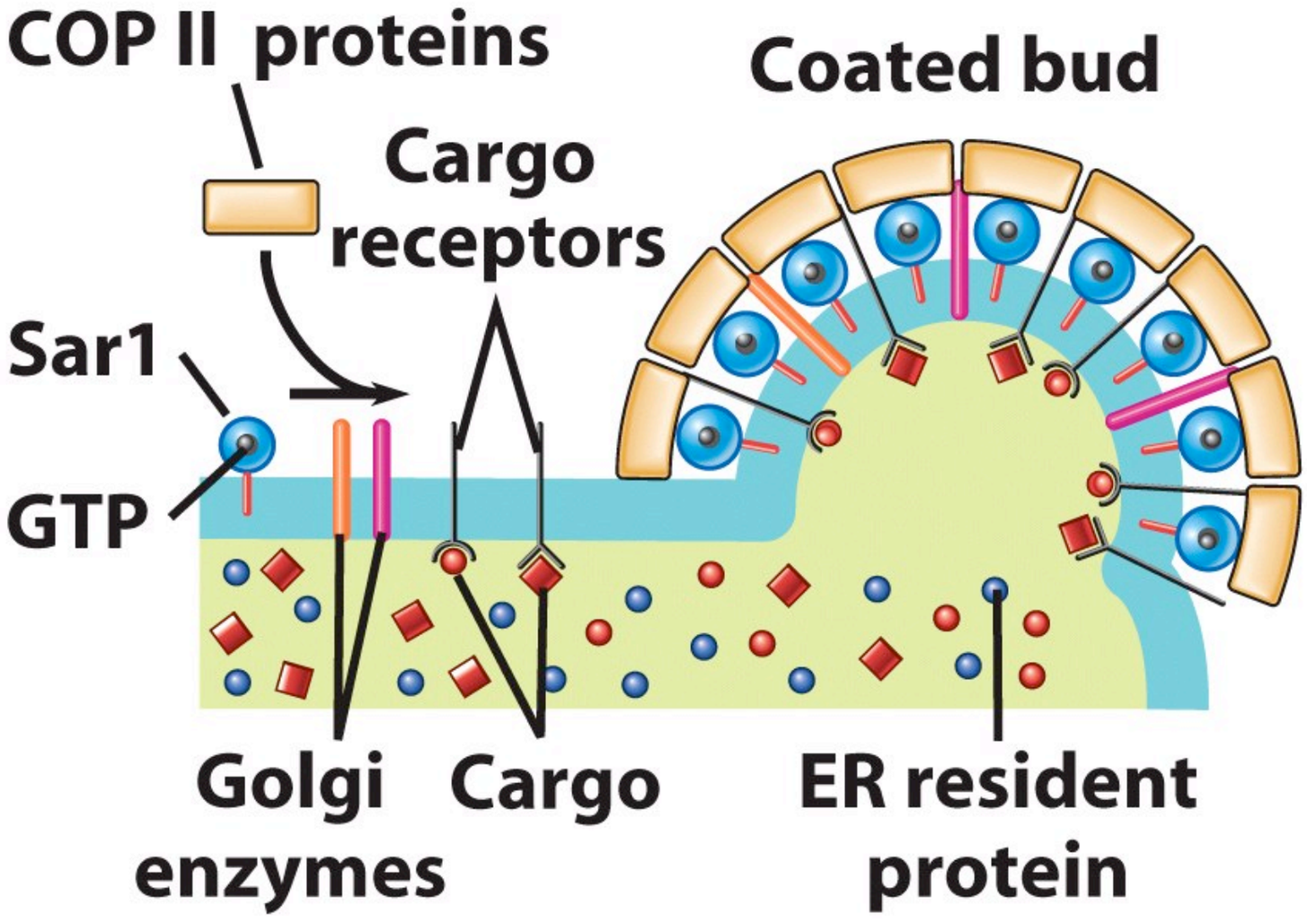


Figure 8-25b Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Assembly of a COP II-coated vesicle

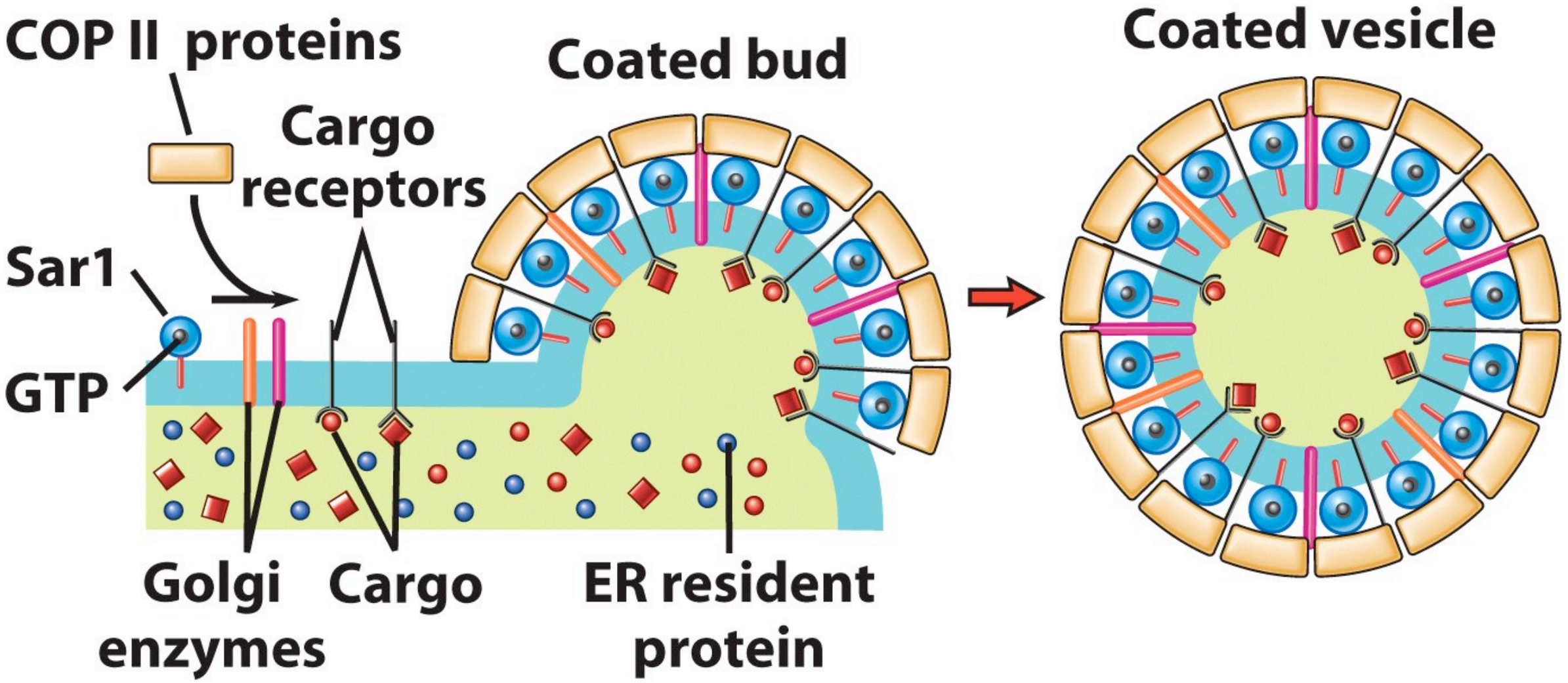


Figure 8-25b Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Assembly of a COP II-coated vesicle

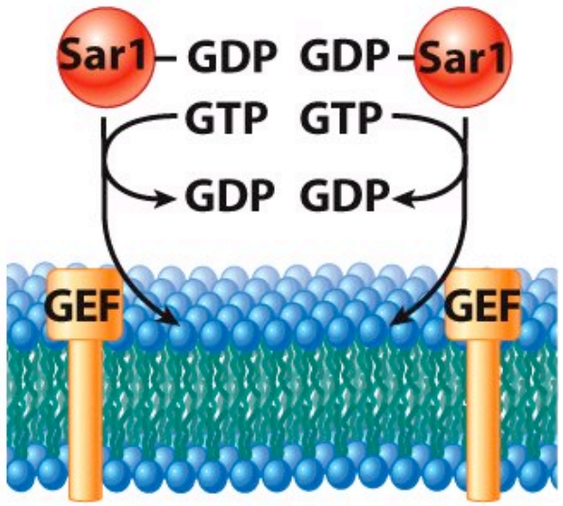


Figure 8-26a Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Role of the COP II coat protein in generating membrane curvature, assembling the protein coat, and capturing cargo

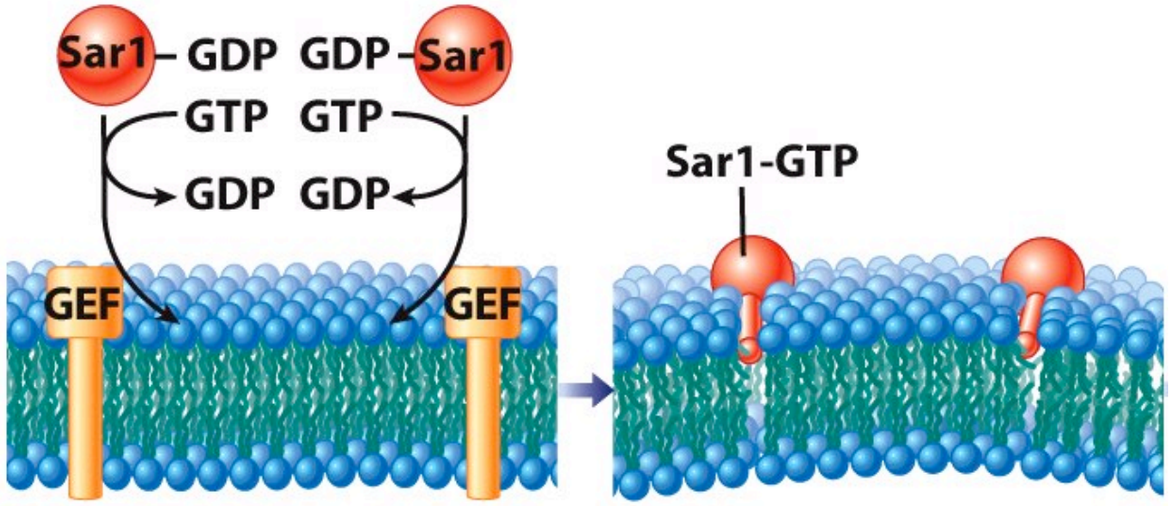


Figure 8-26a Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Role of the COP II coat protein in generating membrane curvature, assembling the protein coat, and capturing cargo

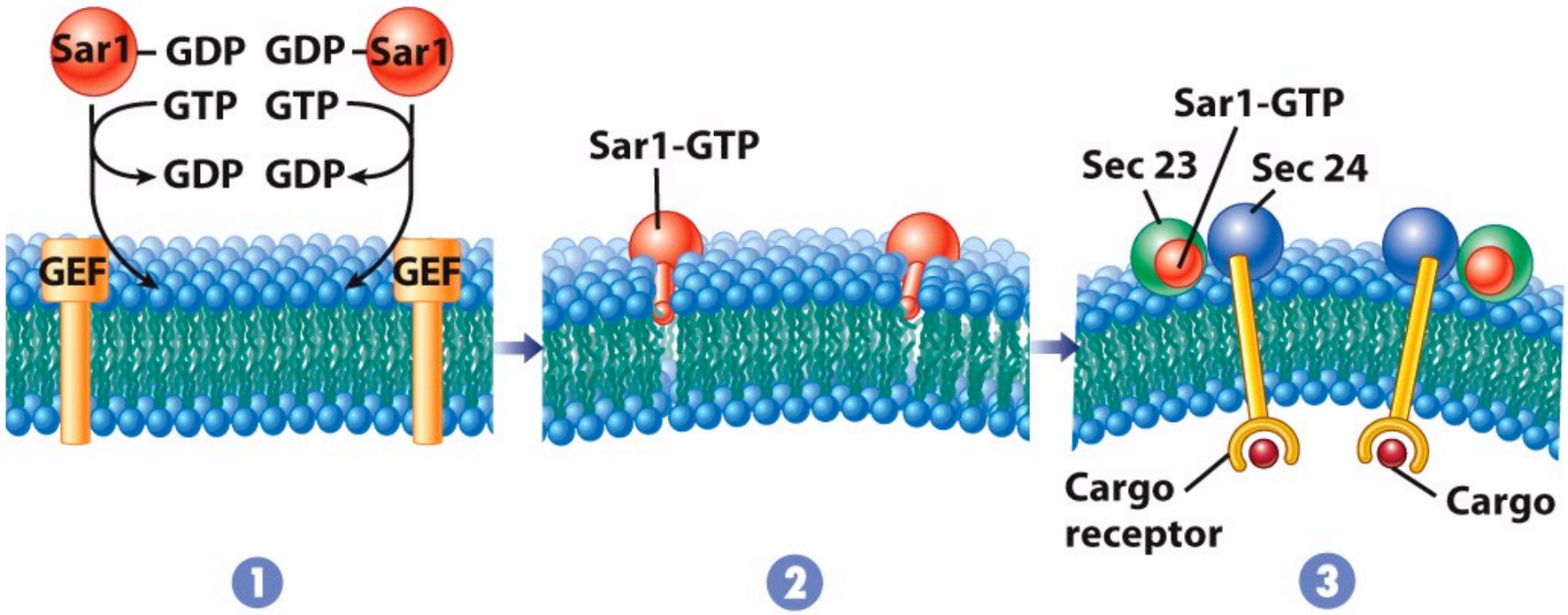


Figure 8-26a Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Role of the COP II coat protein in generating membrane curvature, assembling the protein coat, and capturing cargo

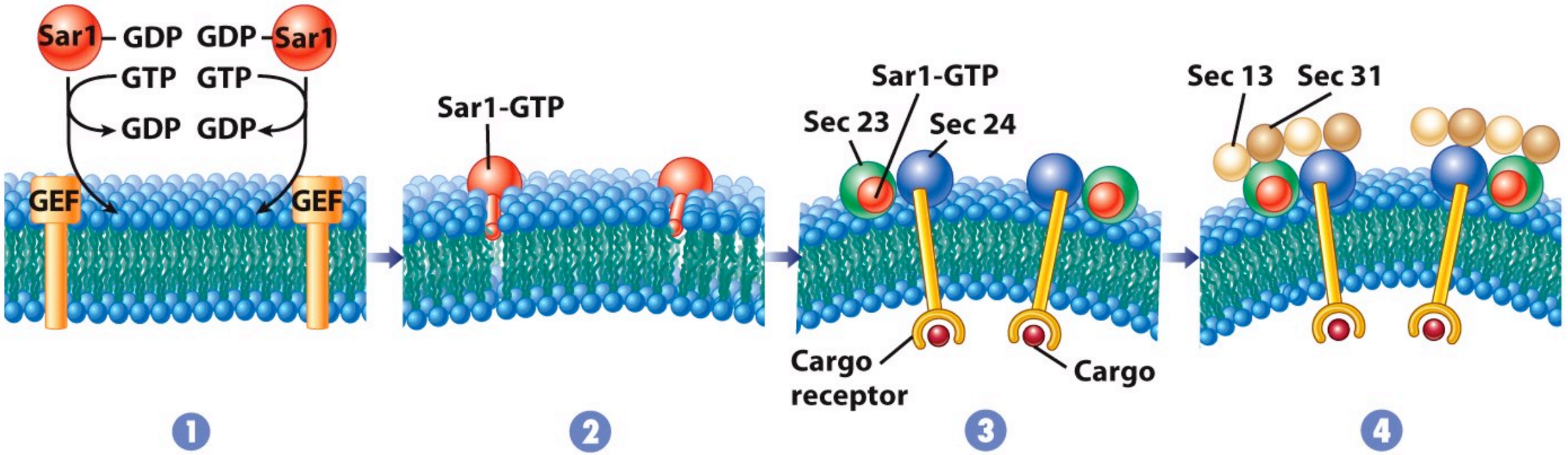
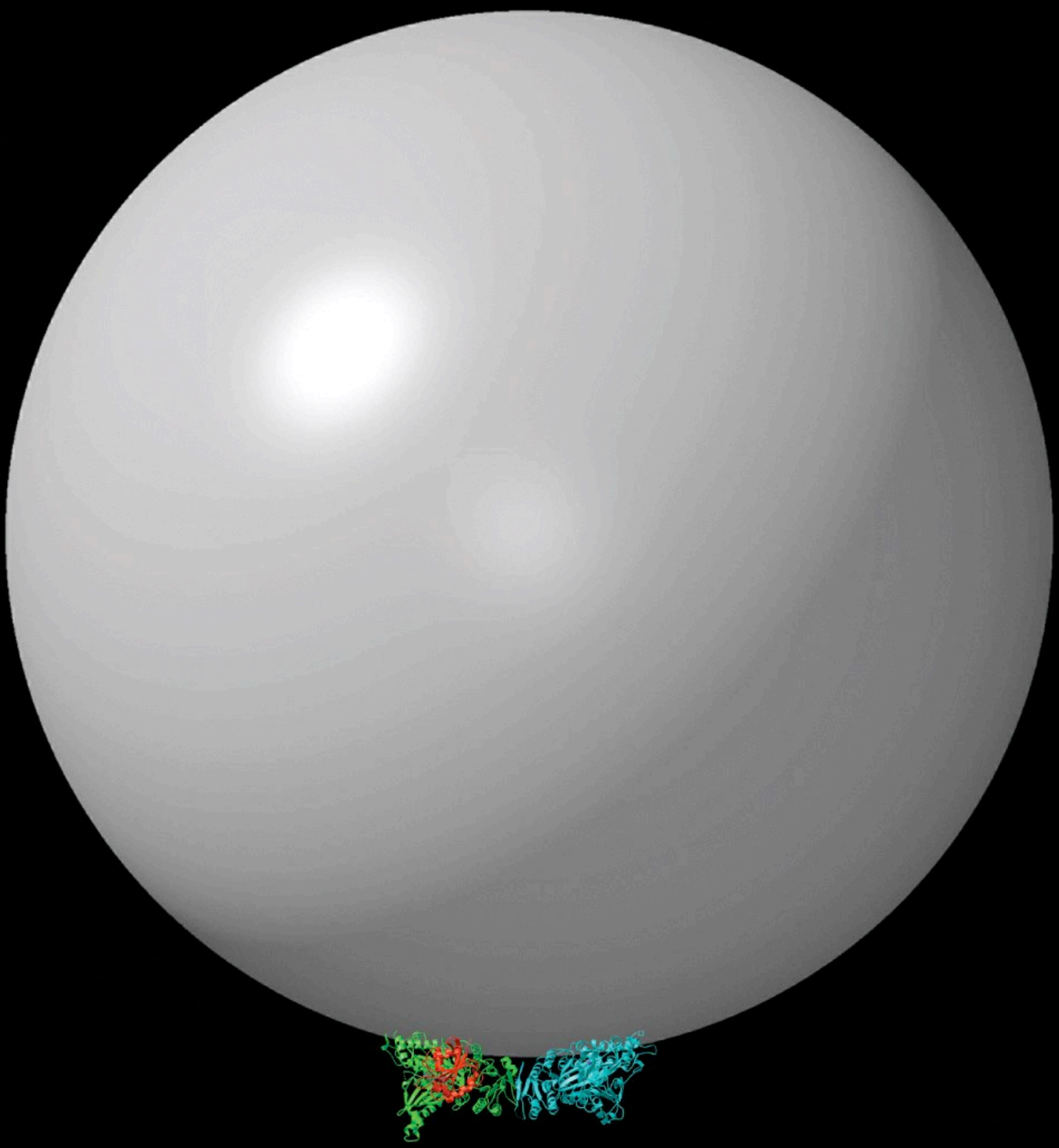
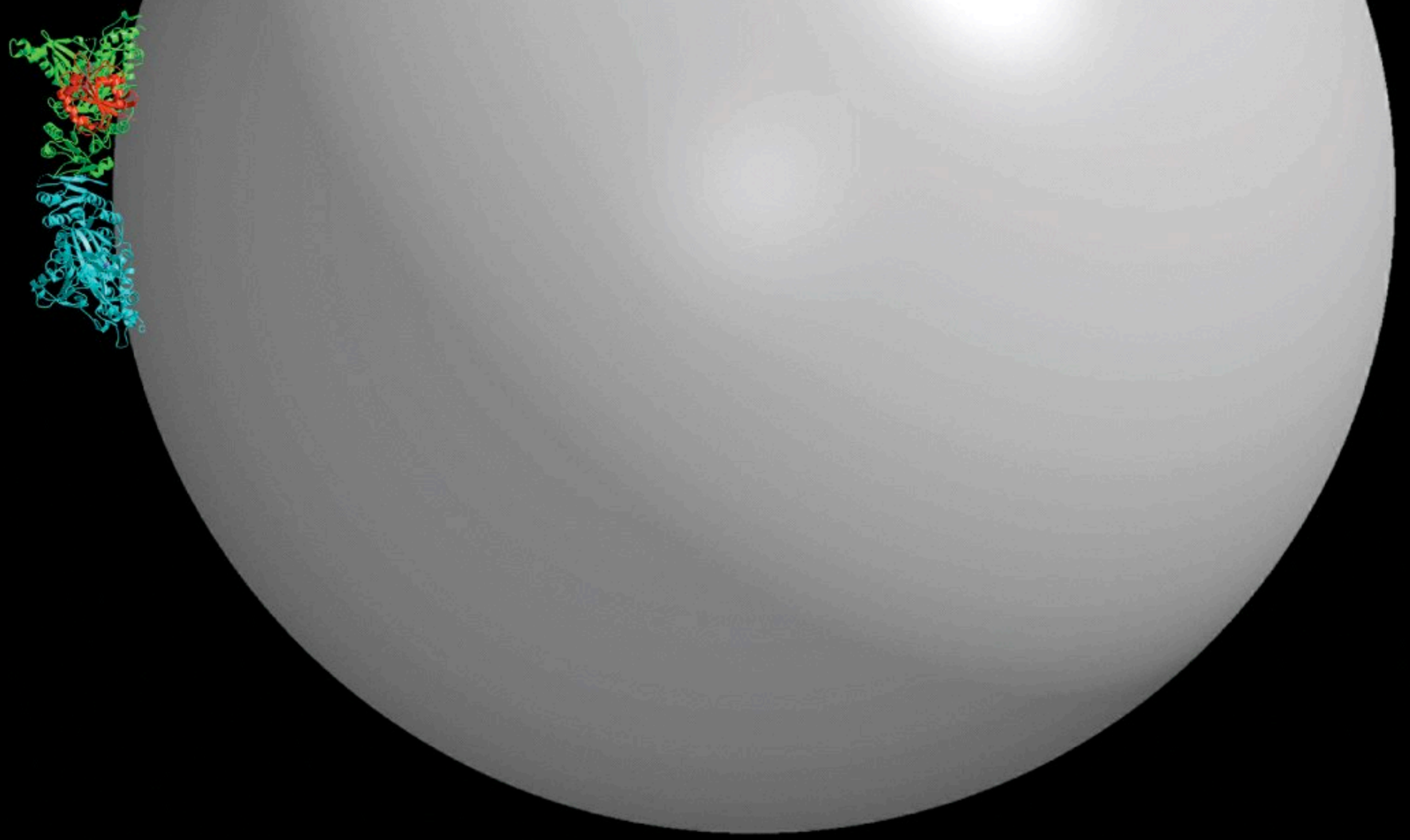


Figure 8-26a Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Role of the COP II coat protein in generating membrane curvature, assembling the protein coat, and capturing cargo





Schematic view of a single Sec23-Sec24-Sar1 complex at the surface of a vesicle 60 nm in diameter

Sorting proteins in the *trans* Golgi network (TGN)

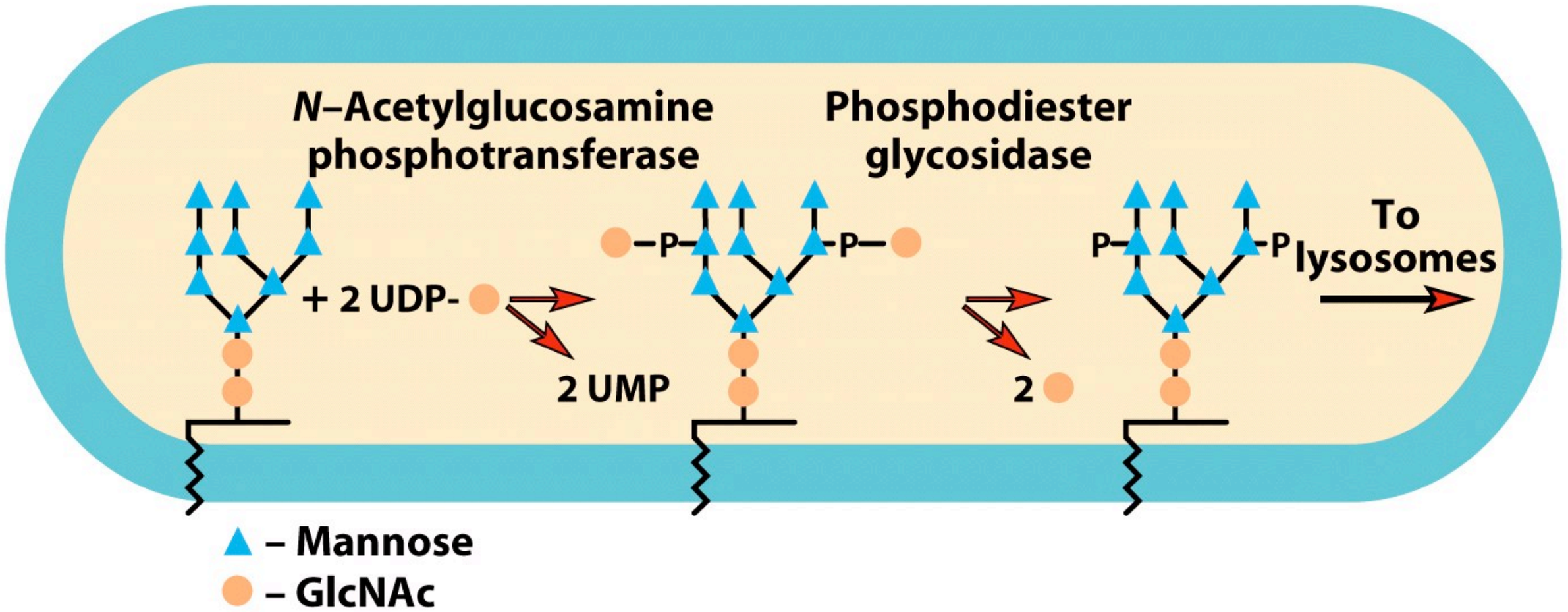


Figure 8-29a Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Targeting lysosomal enzymes to lysosomes

Lysosomal enzymes are recognised by *N*-acetylglucosamine phosphotranserase

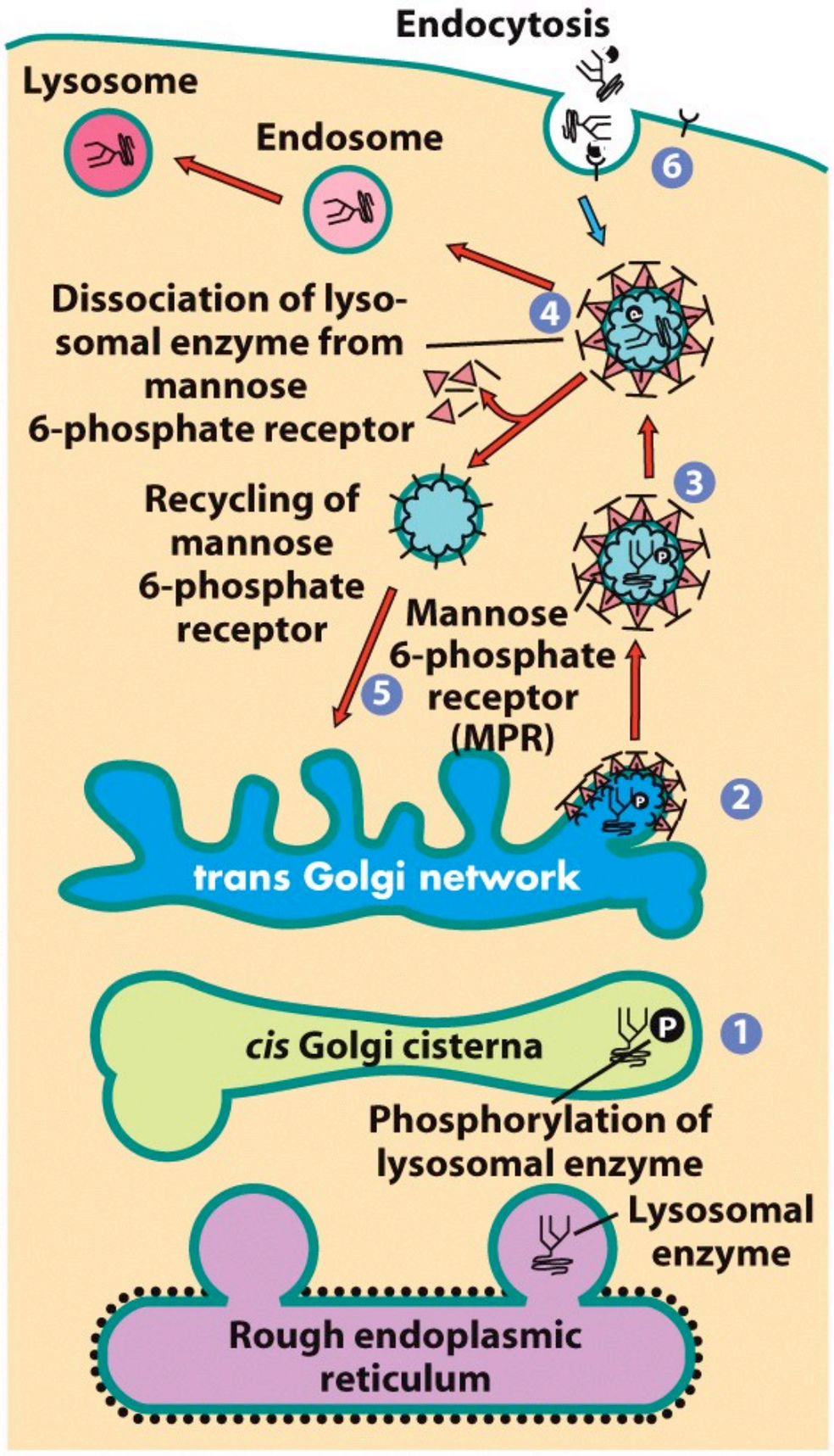


Figure 8-29b Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Targeting lysosomal enzymes to lysosomes

Path from synthesis of lysosomal enzymes on ribosomes on the Rough ER to delivery to a lysosome

Clathrin coated vesicles

Formation of clathrin coated vesicles at the TGN

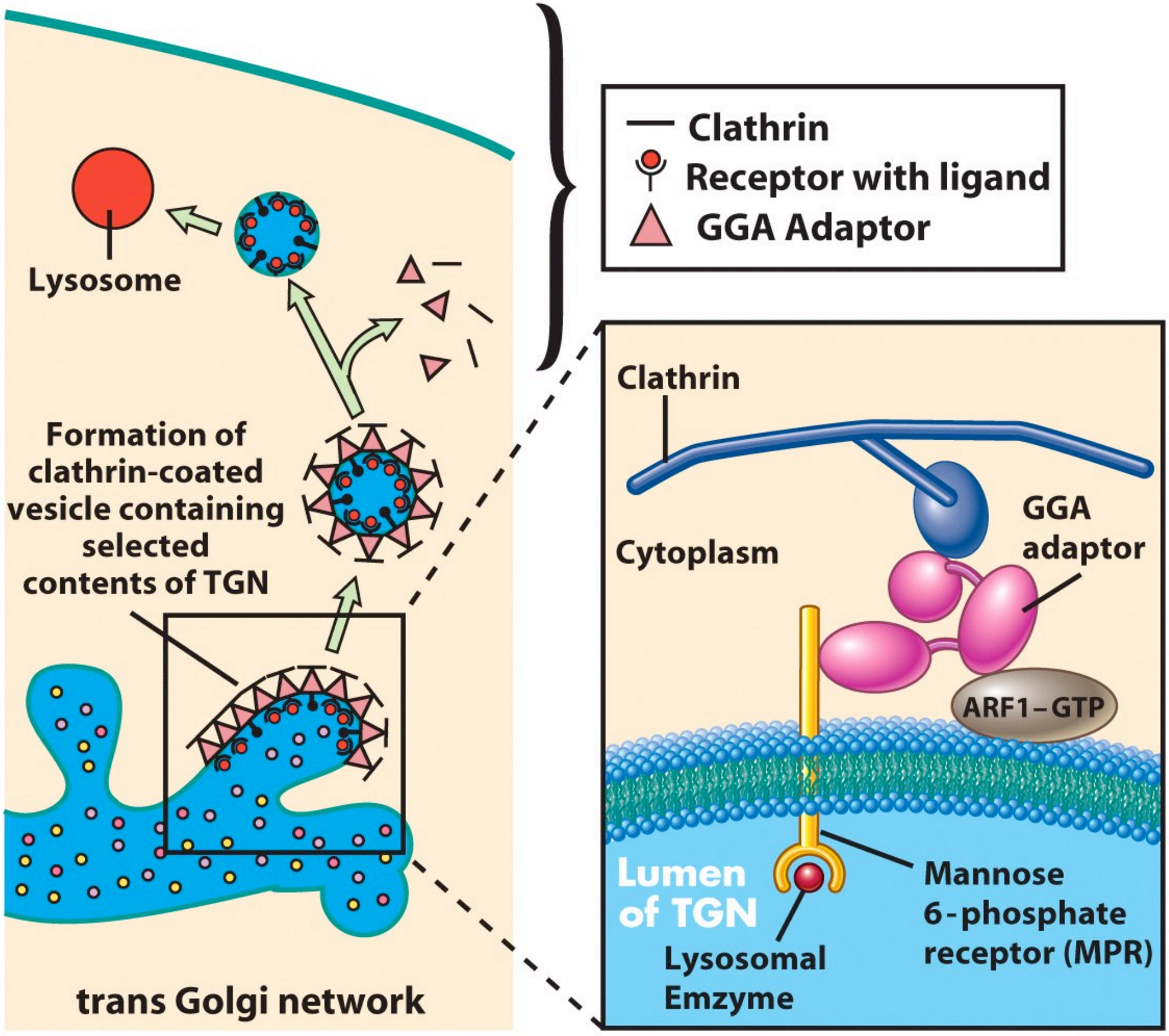


Figure 8-30 Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Clathrin coated vesicles

Molecular organisation

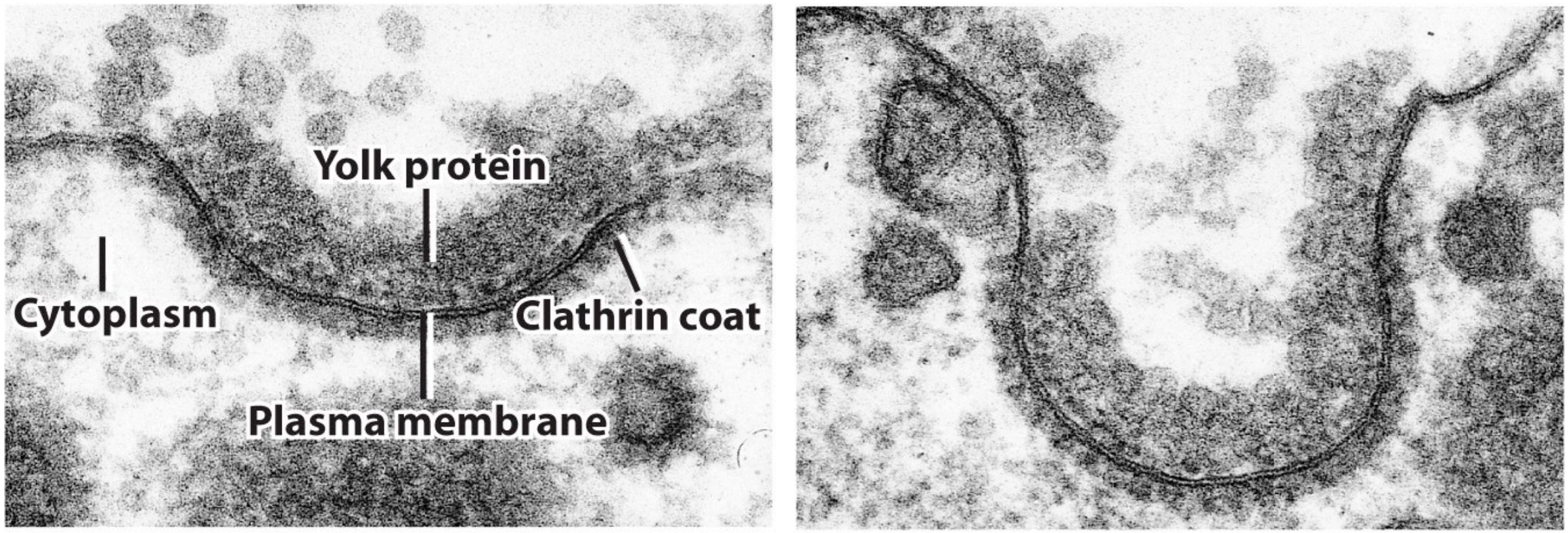


Figure 8-37 Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Receptor-mediated endocytosis

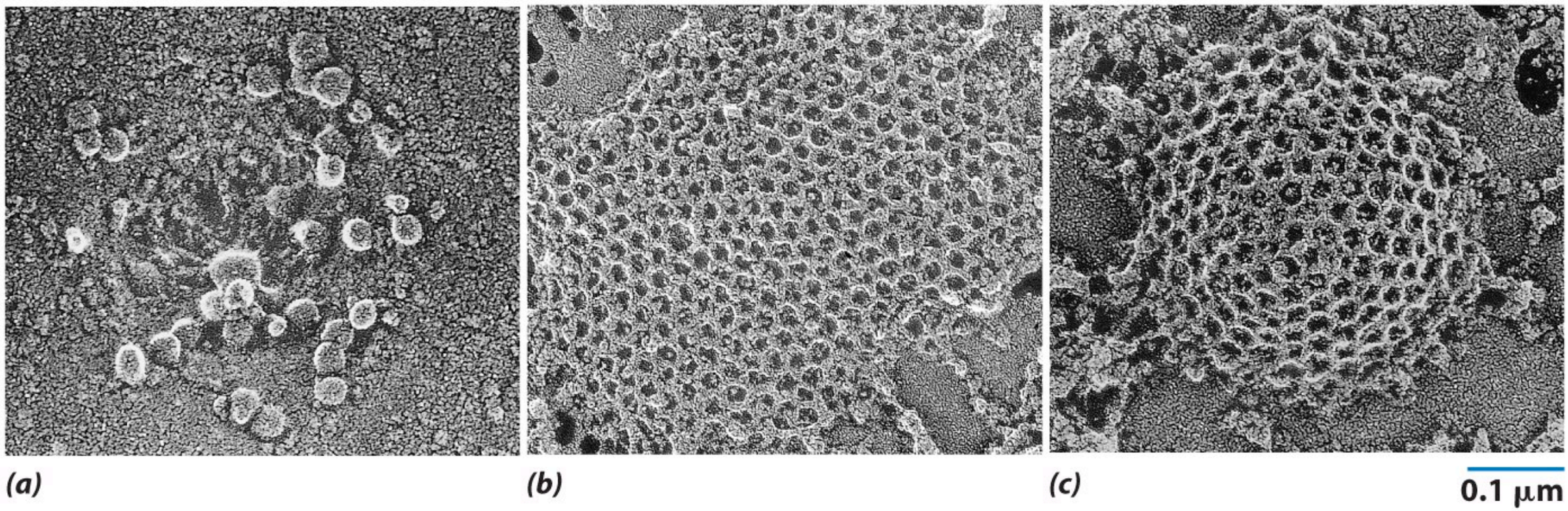


Figure 8-38 Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Coated pits

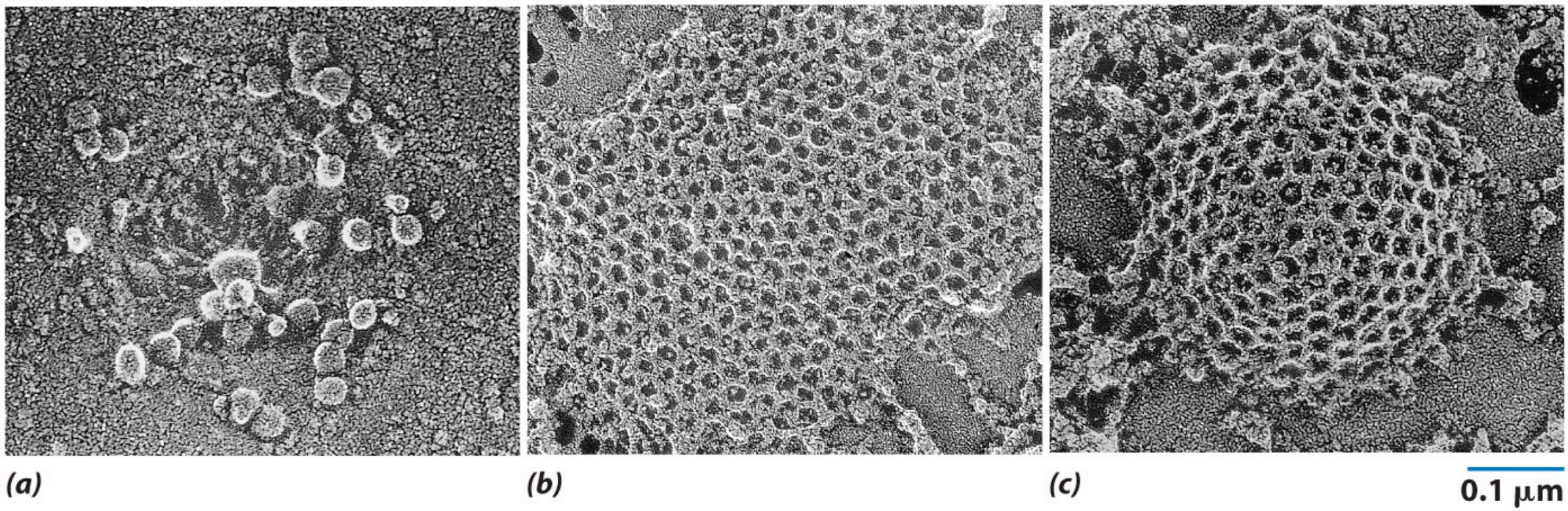
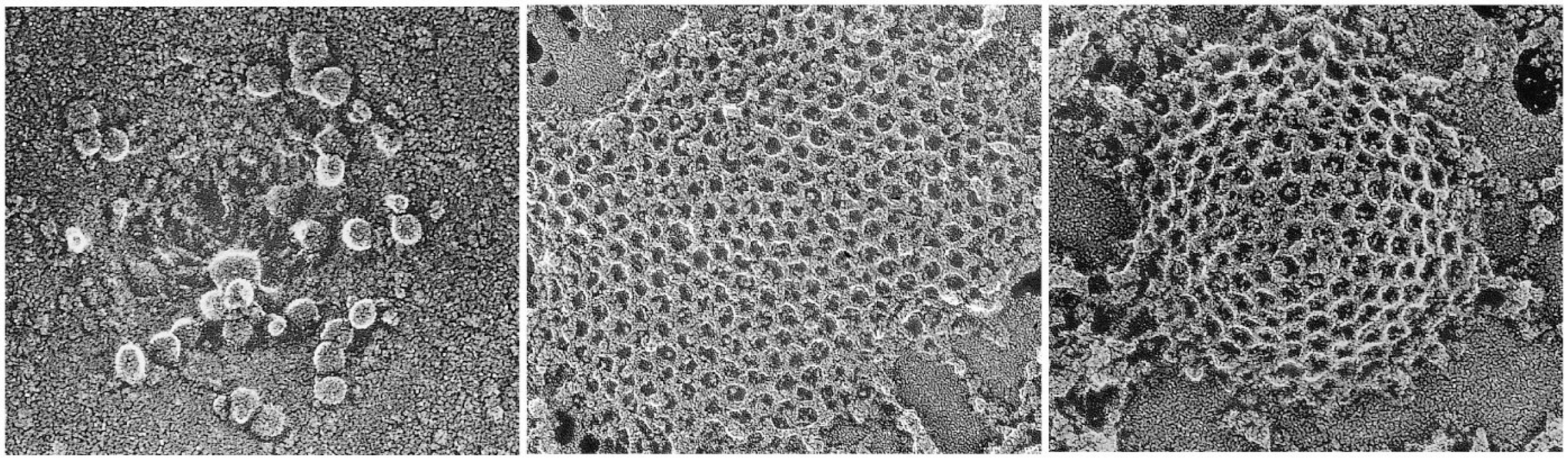


Figure 8-38 Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Extracellular surface

Coated pits



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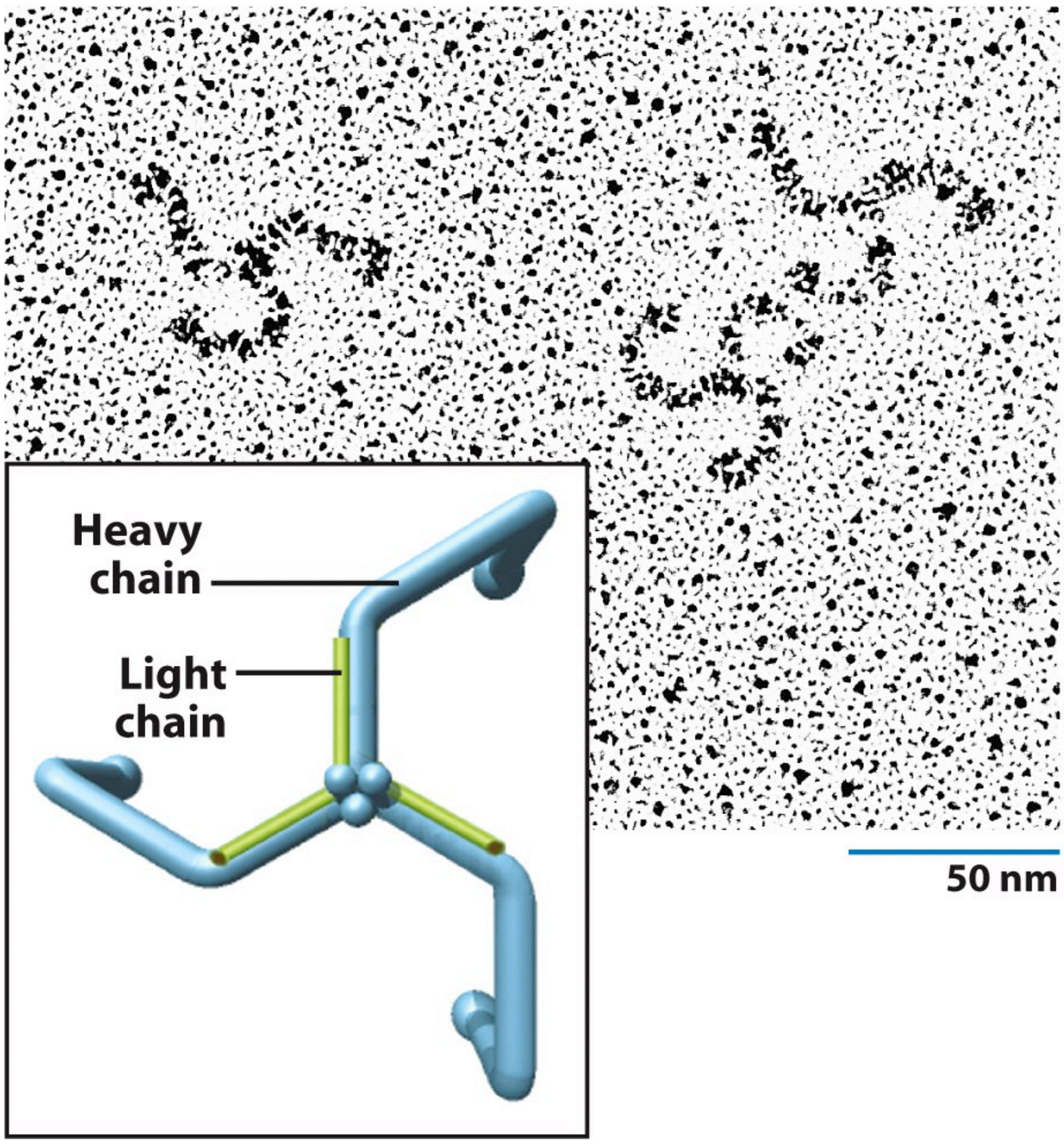
Extracellular surface

Cytosolic surface

Coated pits



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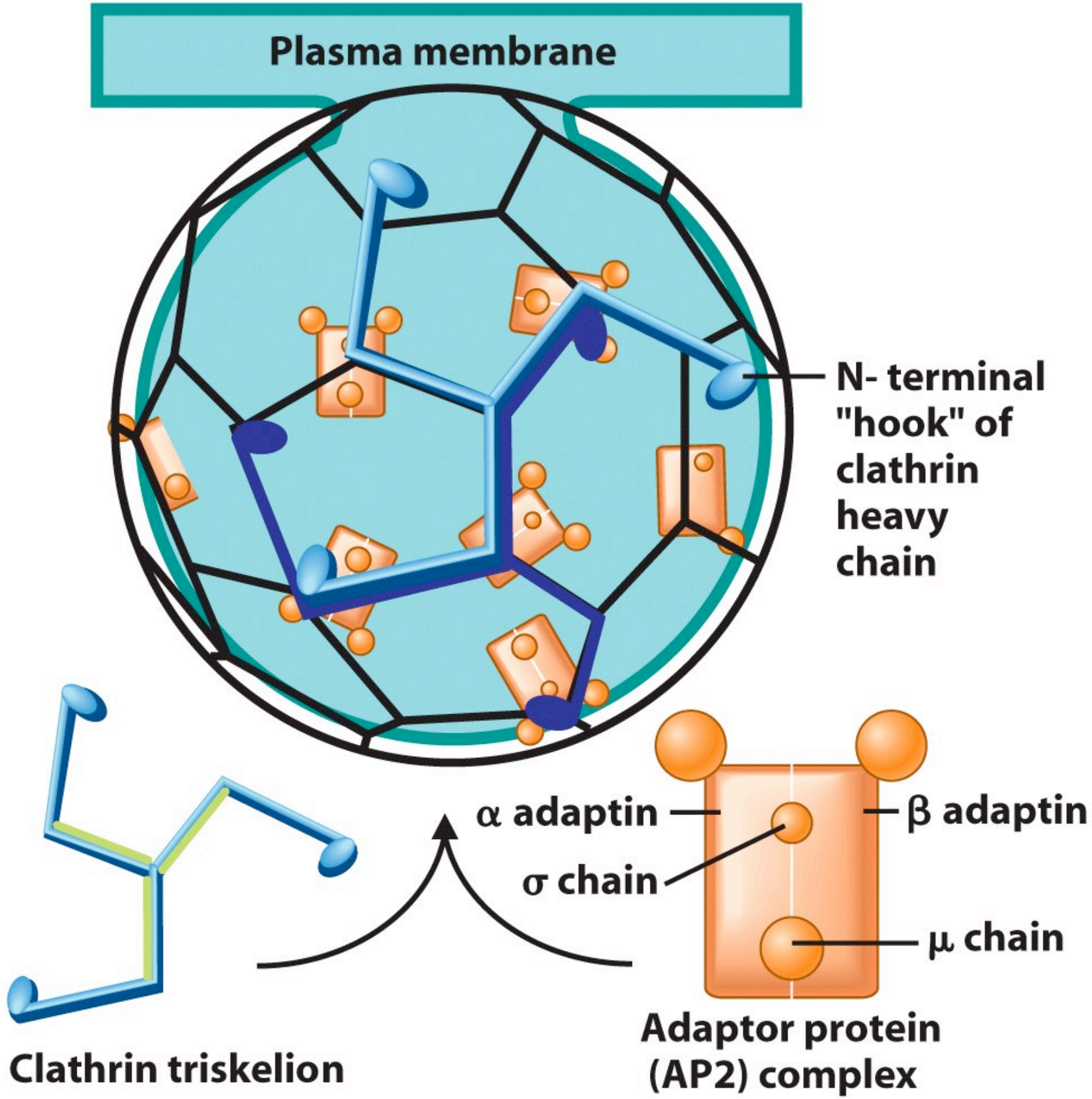


Figure 8-40a Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

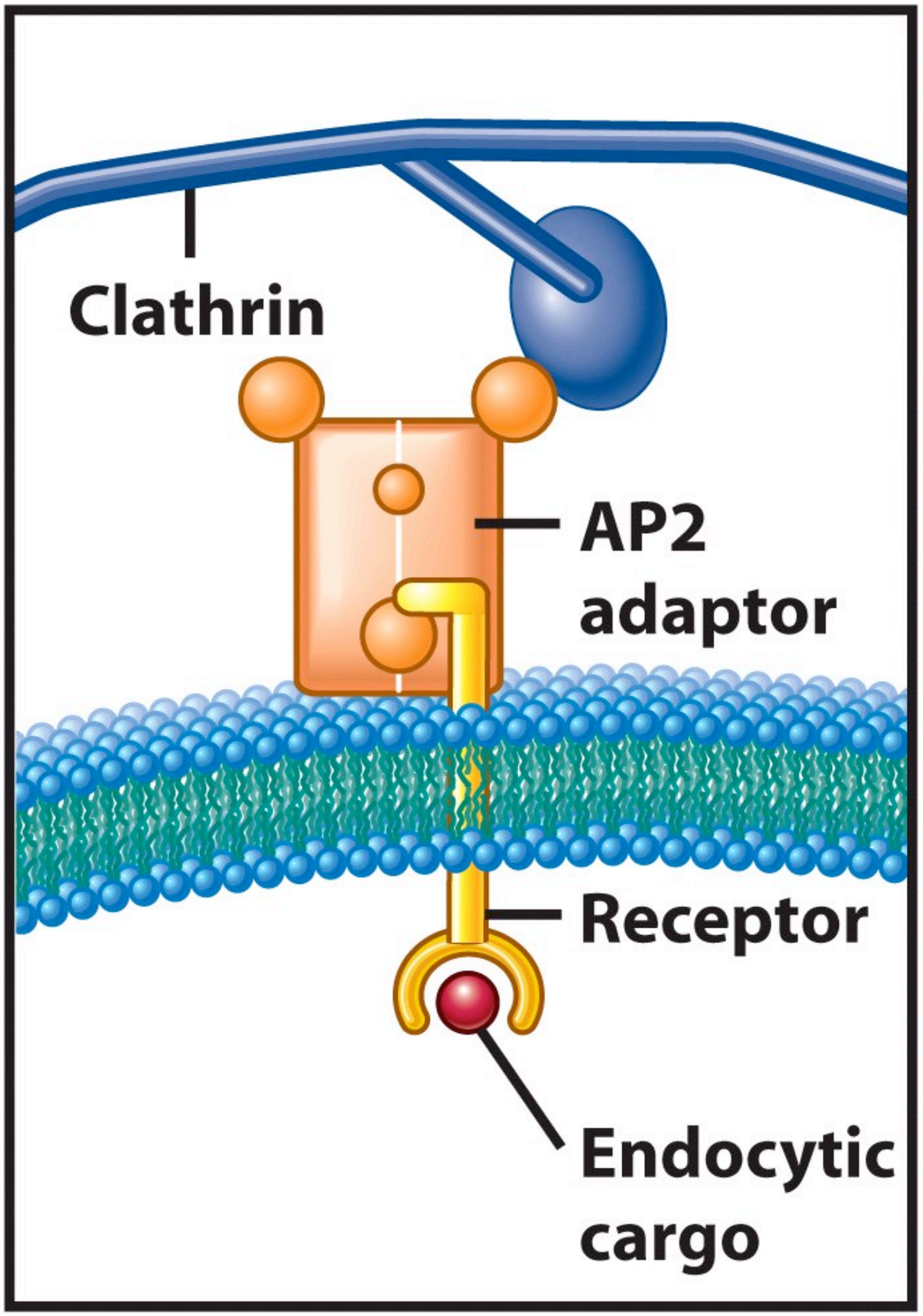


Figure 8-40b Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

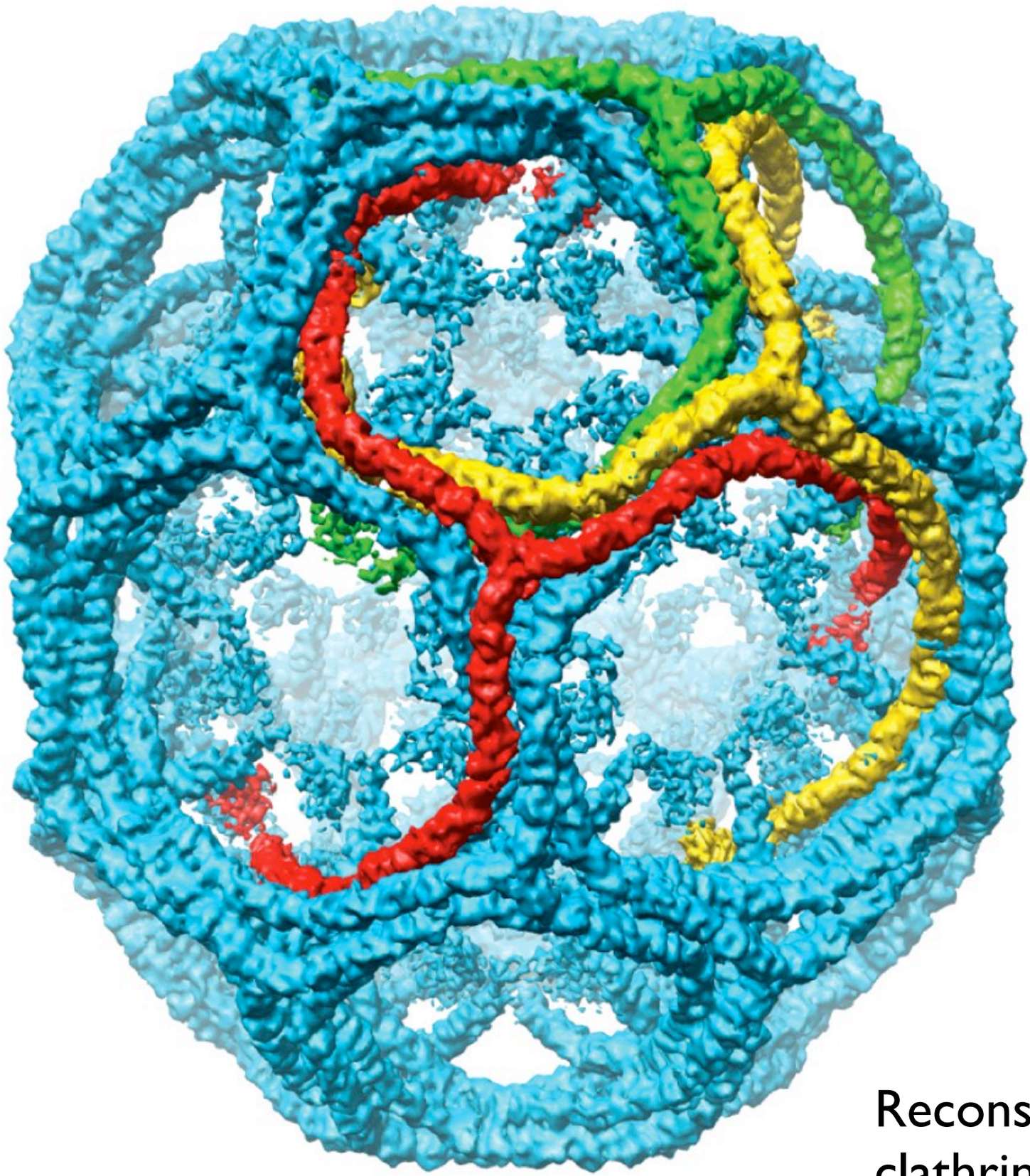


Figure 8-40c Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

Reconstruction of a clathrin cage containing 36 triskelions

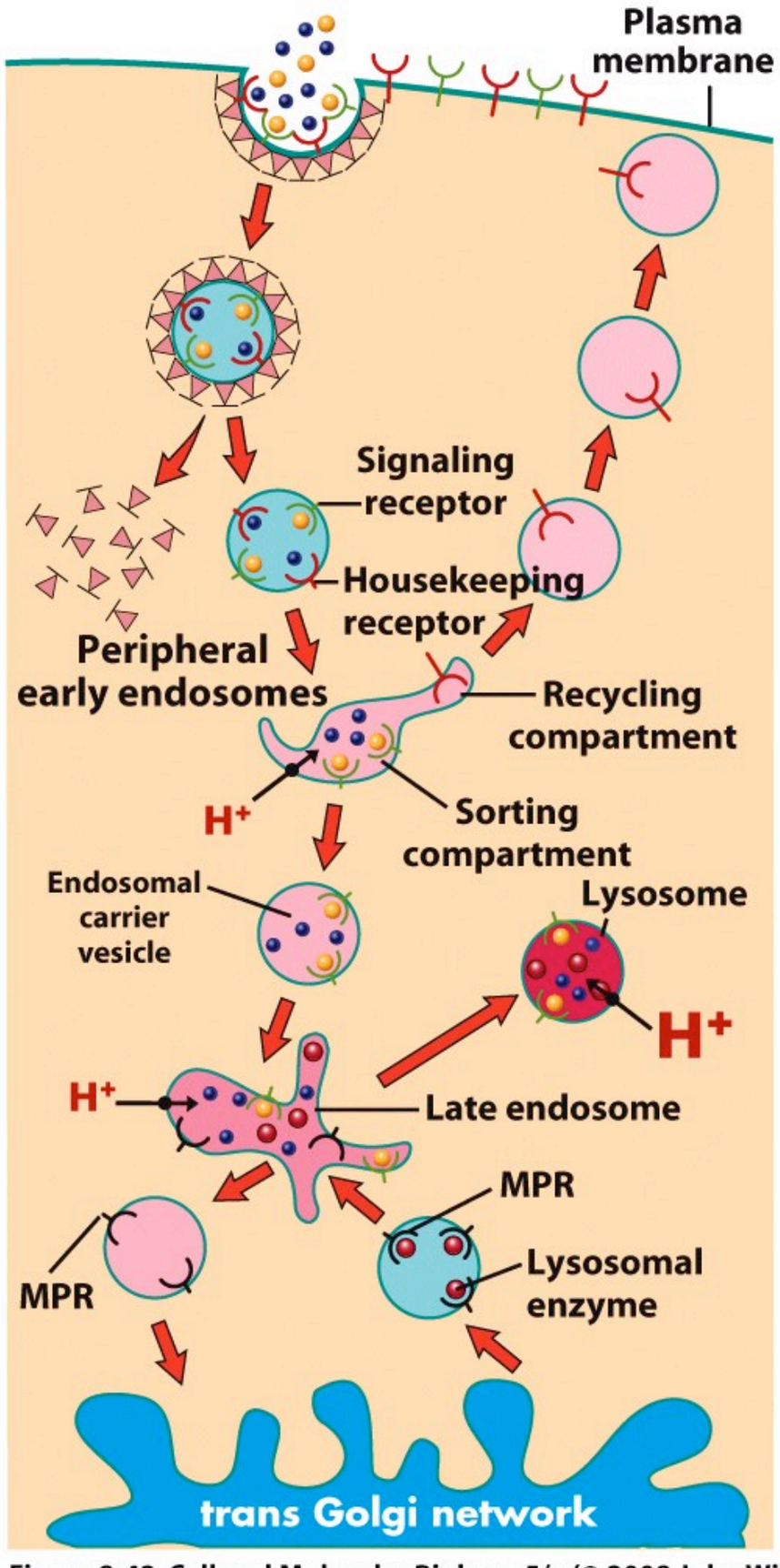


Figure 8-42 Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

The endocytotic pathway

Lysosomes

...and autophagy

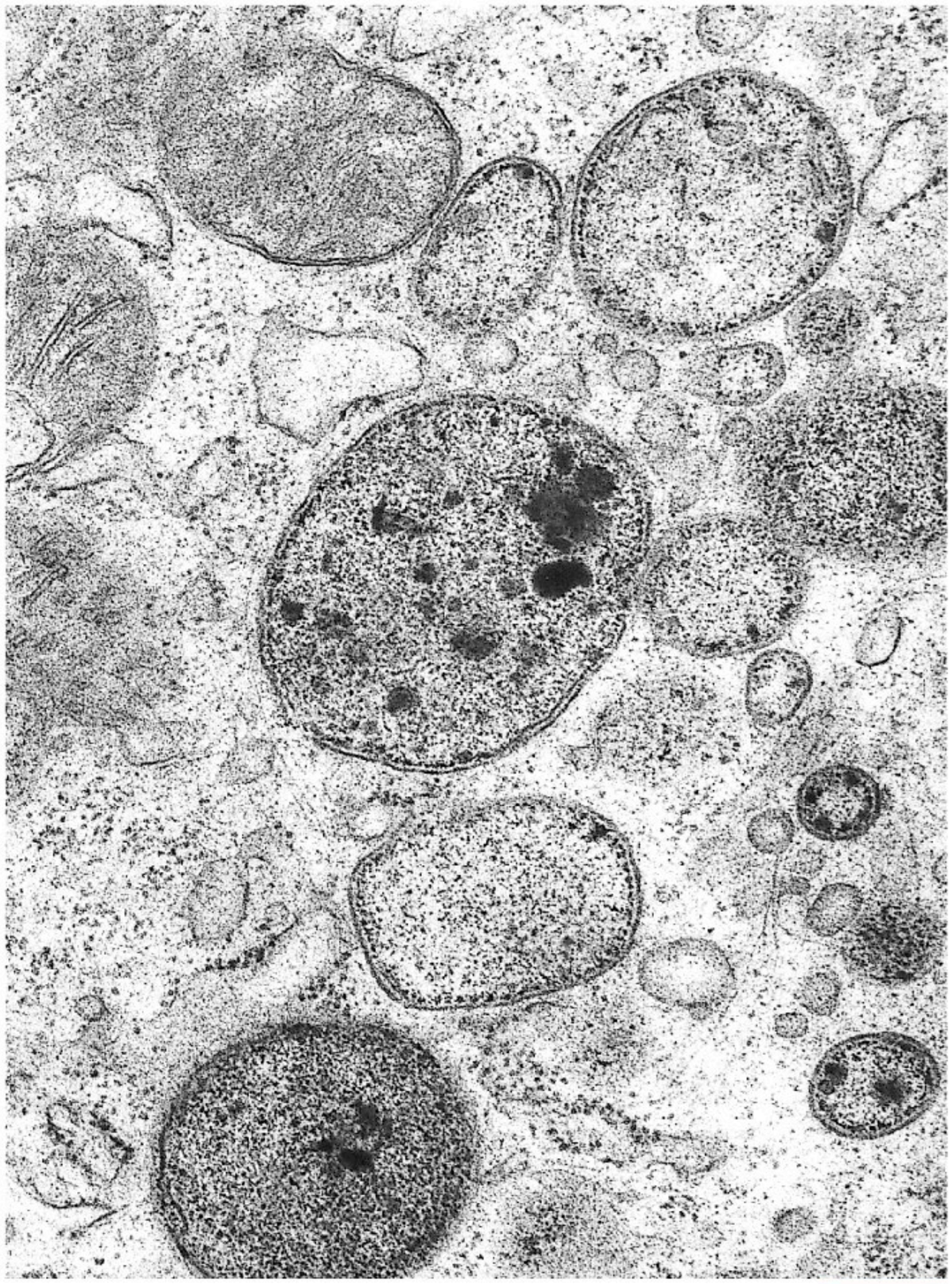


Figure 8-33 Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)

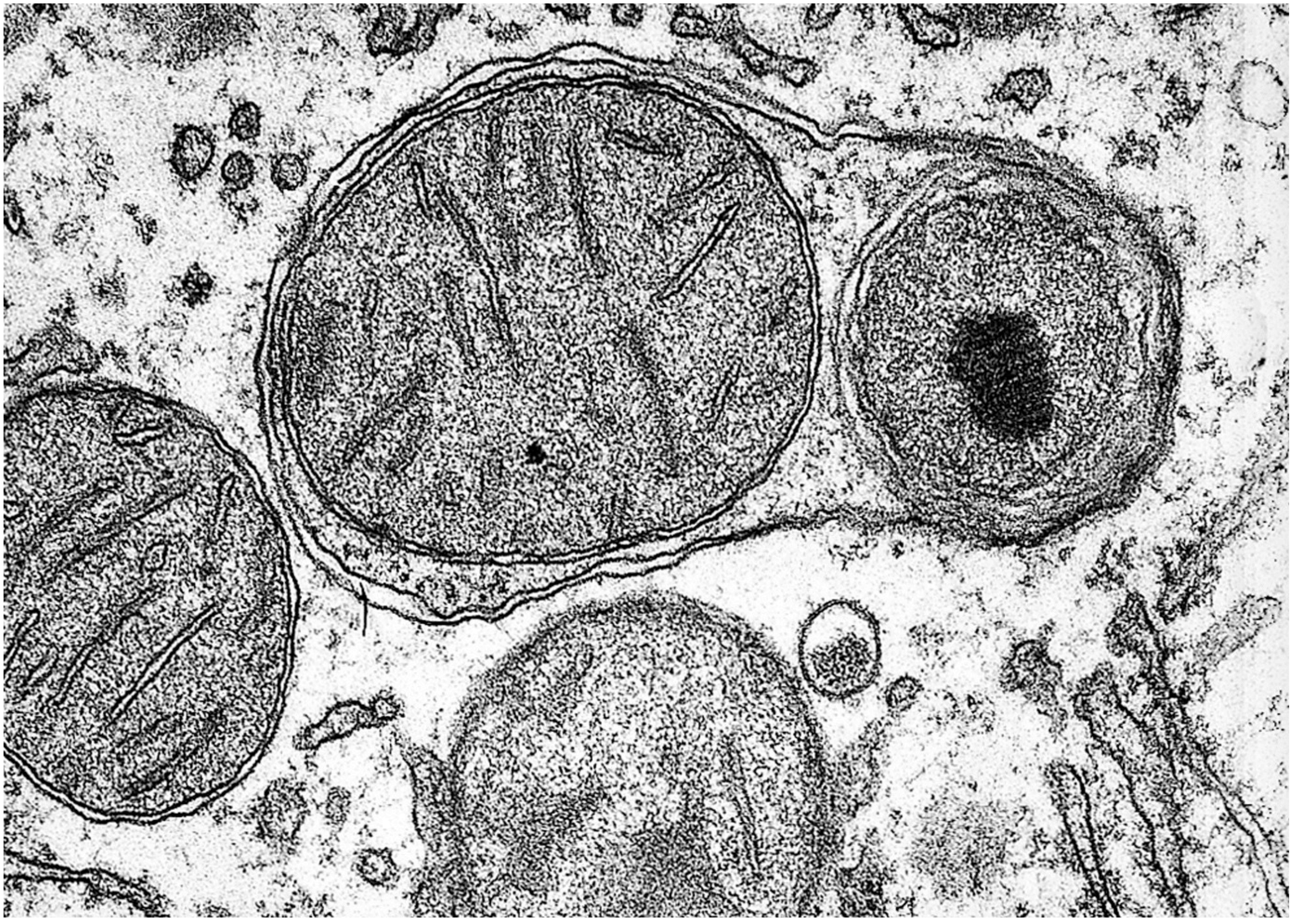
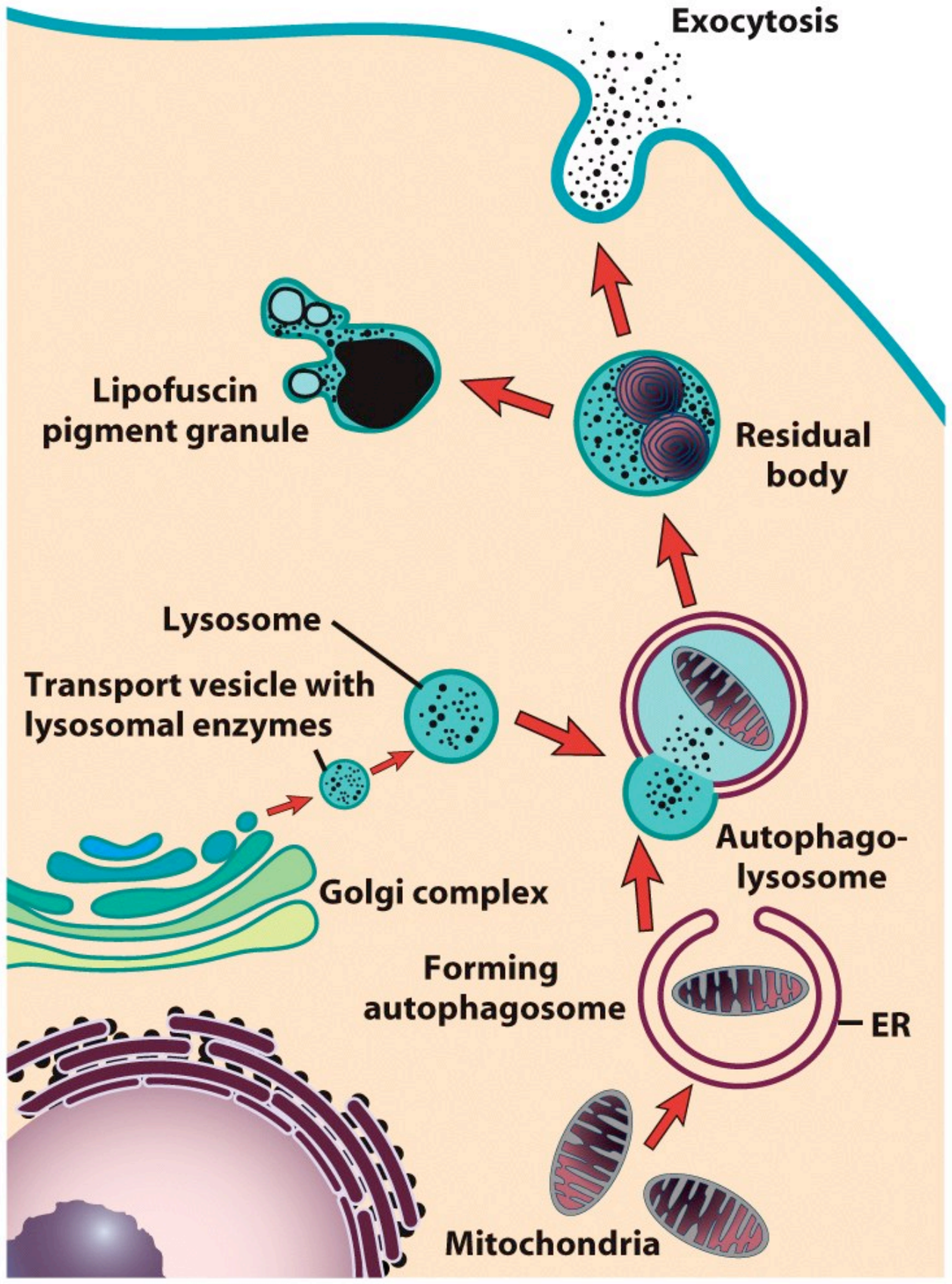


Figure 8-34 Cell and Molecular Biology, 5/e (© 2008 John Wiley & Sons)



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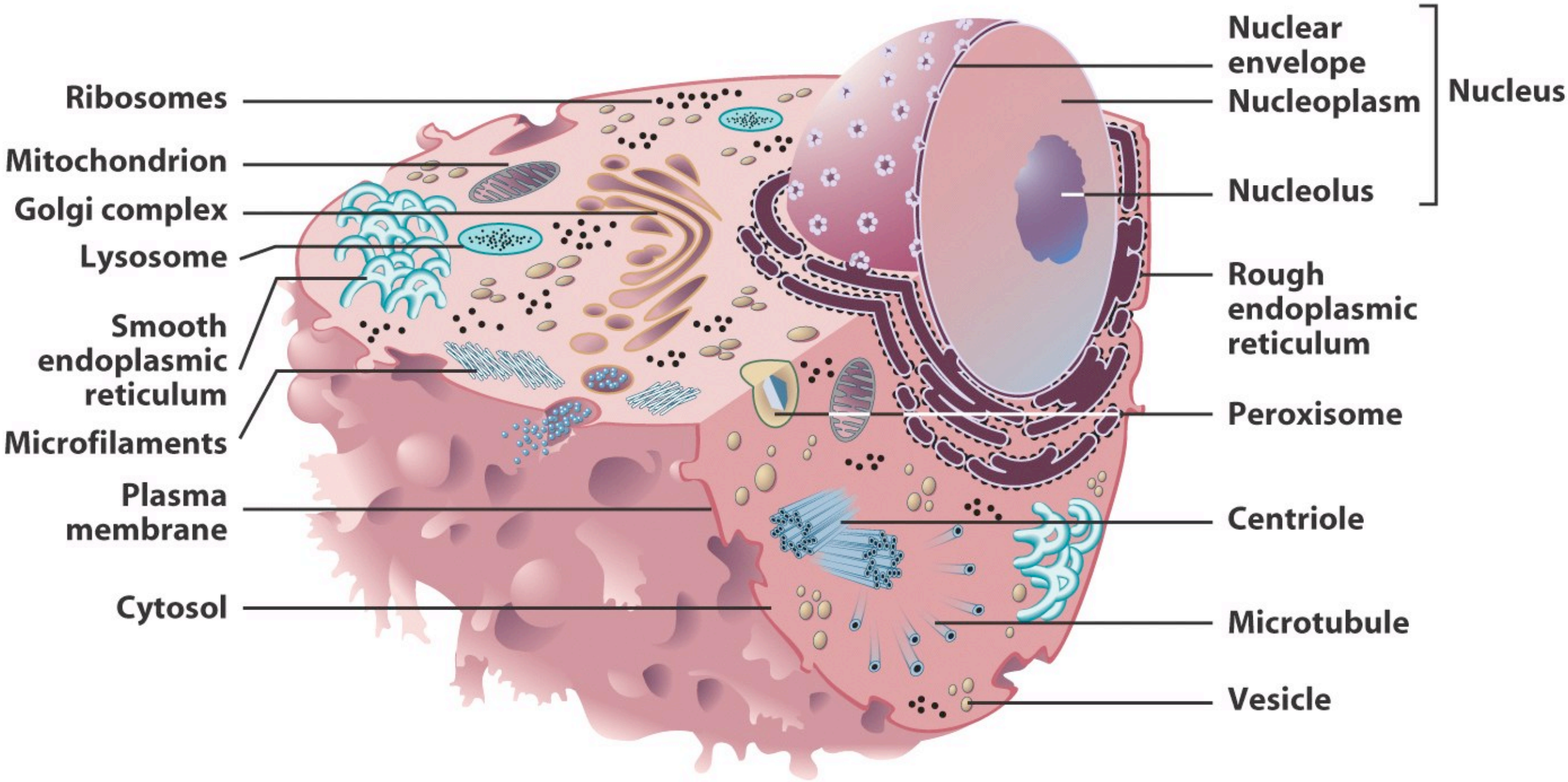

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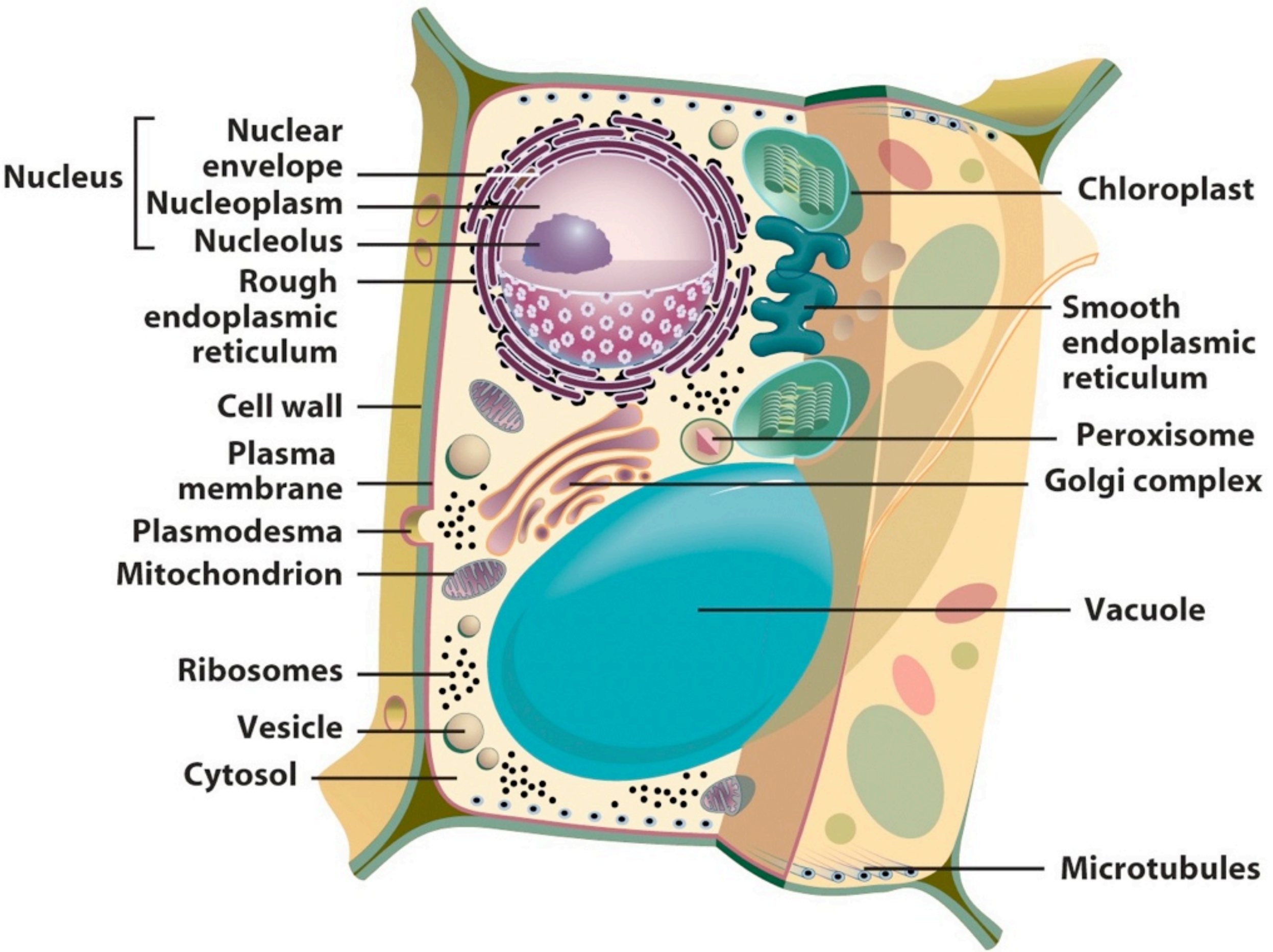

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Membrane transport

Membrane Biochemistry

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http://en.wikipedia.org/wiki/File:Nucleus_ER_golgi.svg