

Chapter 4

Cell Structure and Function

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The Discovery of Cells

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Hooke

Leeuwenhoek

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**The Cell Theory**

cell theory

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**Cell Theory**

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Chapter 4

Section 2 Introduction to Cells

Cell Diversity

Cell Shape

(a) Nerve cell

(b) Skin cells

(c) Egg cell

(d) Bacterial cells

(e) Plant cells

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Section 2 Introduction to Cells

Cell Diversity, Continued

Cell Size

| Side length | Surface area       | Volume             | Surface area/volume ratio |
|-------------|--------------------|--------------------|---------------------------|
| 1 mm        | 6 mm <sup>2</sup>  | 1 mm <sup>3</sup>  | 6:1                       |
| 2 mm        | 24 mm <sup>2</sup> | 8 mm <sup>3</sup>  | 3:1                       |
| 4 mm        | 96 mm <sup>2</sup> | 64 mm <sup>3</sup> | 3:2                       |

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Basic Parts of a Cell

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Internal Organization of a Cell

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Basic Parts of a Cell, *continued*

Plasma Membrane

membrane                      plasma

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Cytoplasm

cytoplasm

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Basic Parts of a Cell, *continued*

Nucleus

nucleus

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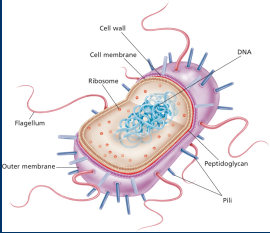
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Chapter 4      Section 2 Introduction to Cells

## Two Basic Types of Cells

**Prokaryotes**  
**Prokaryote cells**



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Chapter 4      Section 2 Introduction to Cells

## Two Basic Types of Cells, *continued*

**Eukaryotes**  
**Eukaryote cells**

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## Comparing Prokaryotes and Eukaryotes

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Cellular Organization

CELLS

TISSUE

ORGAN

ORGAN SYSTEM

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Plasma Membrane

Membrane Lipids

phospholipid

bilayer

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Chapter 4

Section 3 Cell Organelles and Features

### Structure of Lipid Bilayer

1 This phospholipid molecule...

2 ...is part of a lipid bilayer.

3 The lipid bilayer forms the framework of the cell membrane.

4 The lipid bilayer and its associated proteins make up the cell membrane.

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Section 3 Cell Organelles and Features

### Plasma Membrane, continued

#### Membrane Proteins

1 Cell-surface marker: Glycoprotein that identifies cell type

2 Enzyme: Accelerates chemical reaction

3 Transport protein: Helps substances move across

4 Enzyme: Accelerates chemical reaction

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### Plasma Membrane, continued

#### Fluid Mosaic Model

*fluid mosaic model*

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Nucleus

nucleus

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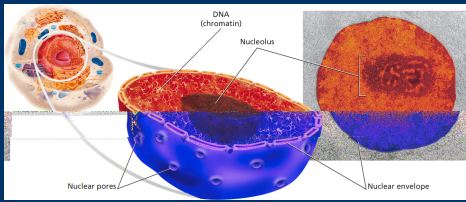
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Nucleus of a Cell



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Nuclear Envelope

nuclear envelope.

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Nucleolus  
nucleolus

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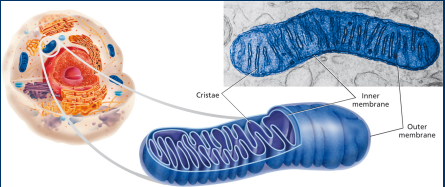
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Mitochondria

Mitochondria



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Endoplasmic Reticulum (ER) and Ribosomes

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Golgi apparatus

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Section 3 Cell Organelles and Features

Processing of Proteins

Bio graphic

Processing of Proteins

Proteins are processed by an internal system of membranes.

5

Other vesicles remain in the cell and become lysosomes.

4

Some vesicles release their proteins outside the cell.

3

Proteins are modified in the Golgi apparatus and enter new vesicles.

2

Vesicles from the Golgi

1

Proteins are made by ribosomes on the rough ER.

any proteins rough ER to apparatus.

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cytoskeleton

microfilaments

microtubules

intermediate filaments

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### Cytoskeleton

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Cilia and Flagella

Cilia      flagella

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**Chapter 4**      **Section 4** Unique Features of Plant Cells

**Cell Wall**

cell wall

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**Parts of a Cell Wall**

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central vacuoles

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Plastids

chloroplast

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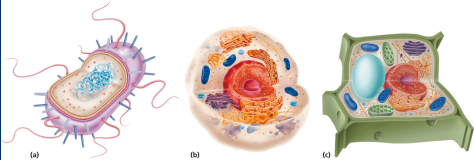
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