

7-4 The Diversity of Cellular Life



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The differences among living things arise from the ways in which cells are specialized to perform certain tasks and the ways in which cells associate with one another to form multicellular organisms.

Unicellular Organisms

Unicellular organisms are made up of only one cell.

Unicellular organisms dominate life on Earth.

Multicellular Organisms

Organisms that are made up of many cells are called multicellular.

There is a great variety among multicellular organisms.



What is cell specialization?



Cells throughout an organism can develop in different ways to perform different tasks.

This process is called **cell specialization**.

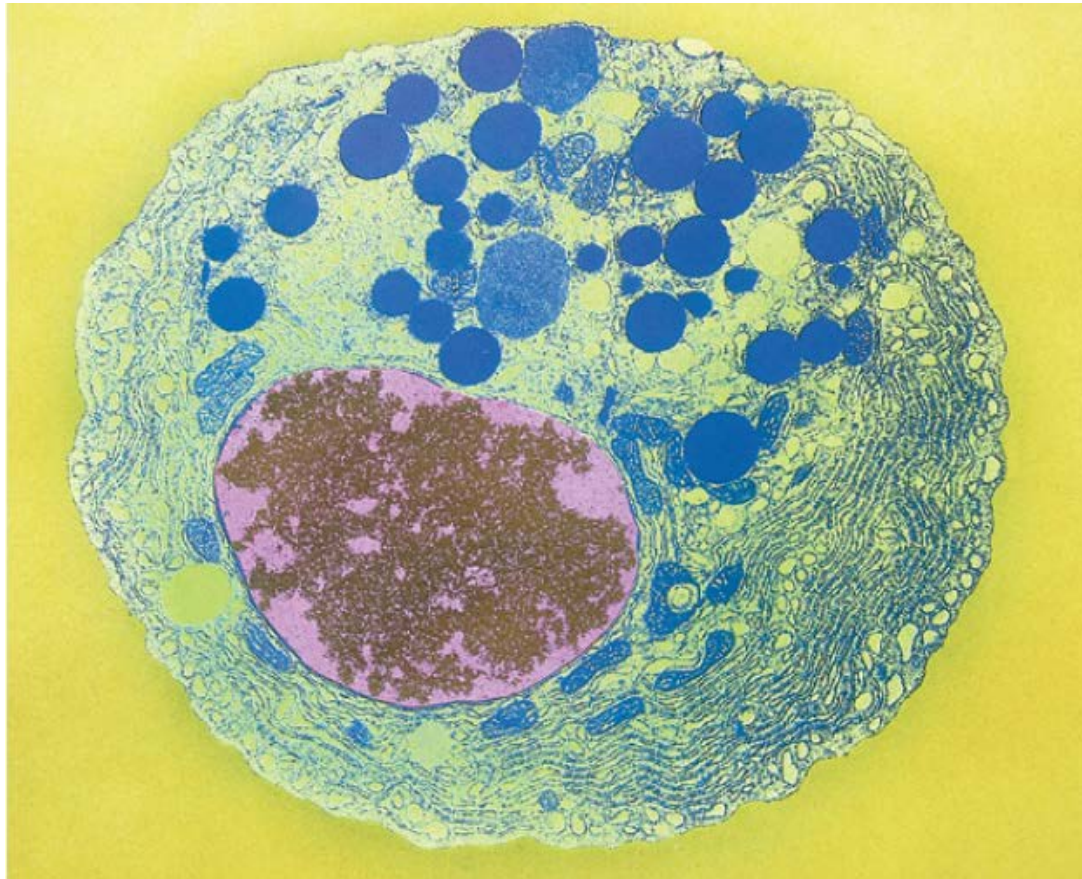
Specialized Animal Cells

Animal cells are specialized in many ways.

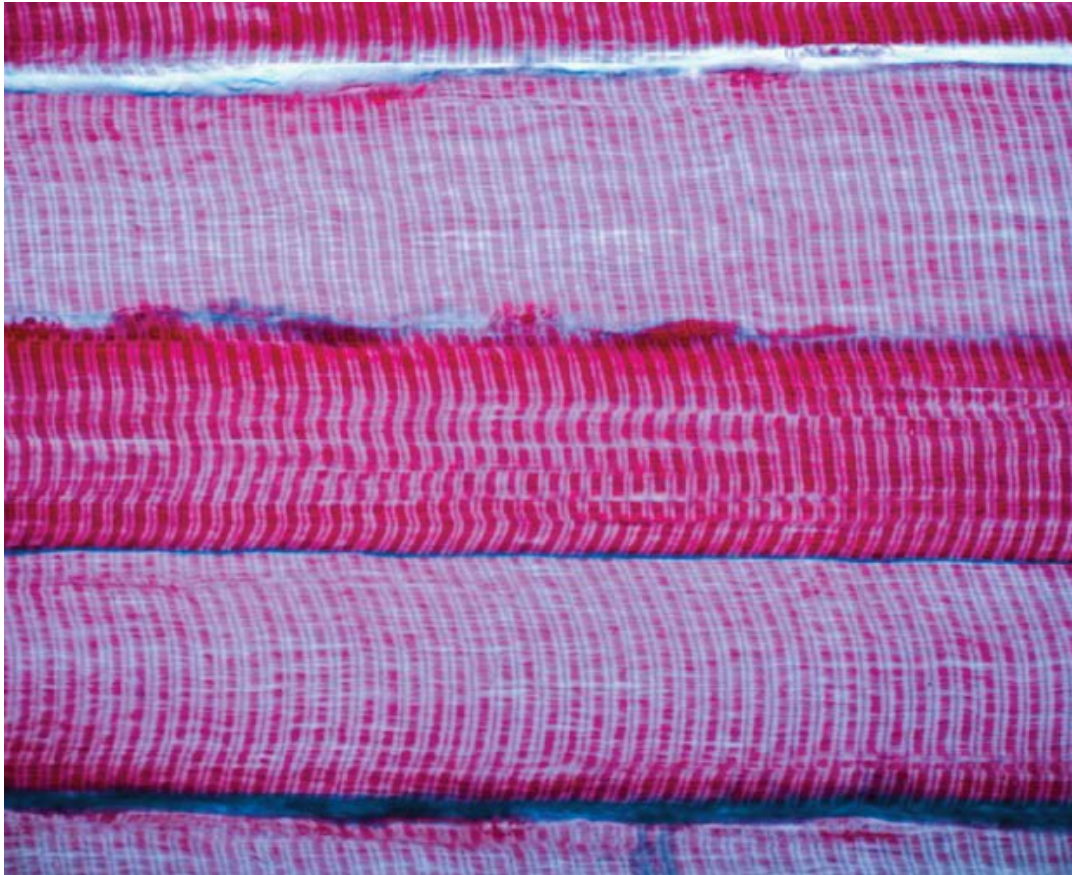
Red blood cells transport oxygen.



Cells in the pancreas produce proteins.



Muscle cells allow movement.



Specialized Plant Cells

Plants exchange carbon dioxide, oxygen, water vapor, and other gases through tiny openings called stomata on the undersides of leaves.

Highly specialized cells, known as guard cells, regulate this exchange.

Stomata enclosed by guard cells.





What are the four levels of organization in multicellular organisms?

Levels of Organization

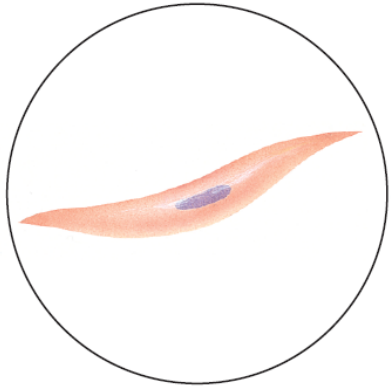


The levels of organization in a multicellular organism are:

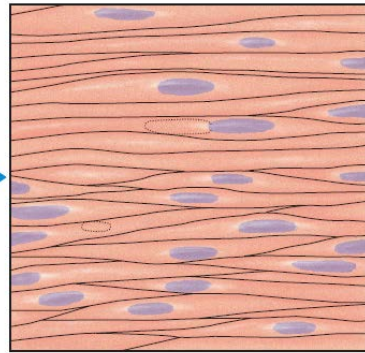
- **individual cells**
- **tissues**
- **organs**
- **organ systems**

Levels of Organization

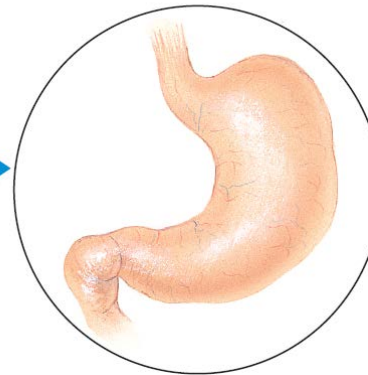
Muscle cell



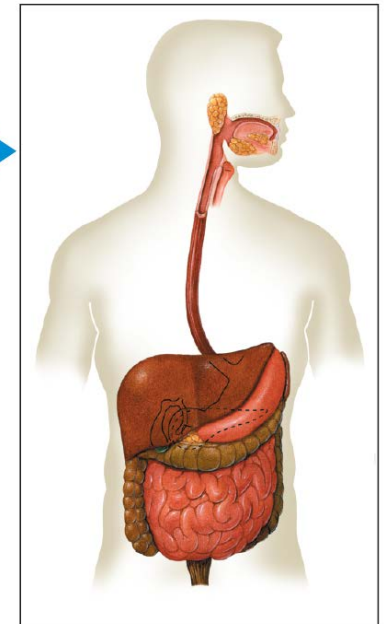
Smooth muscle tissue



Stomach

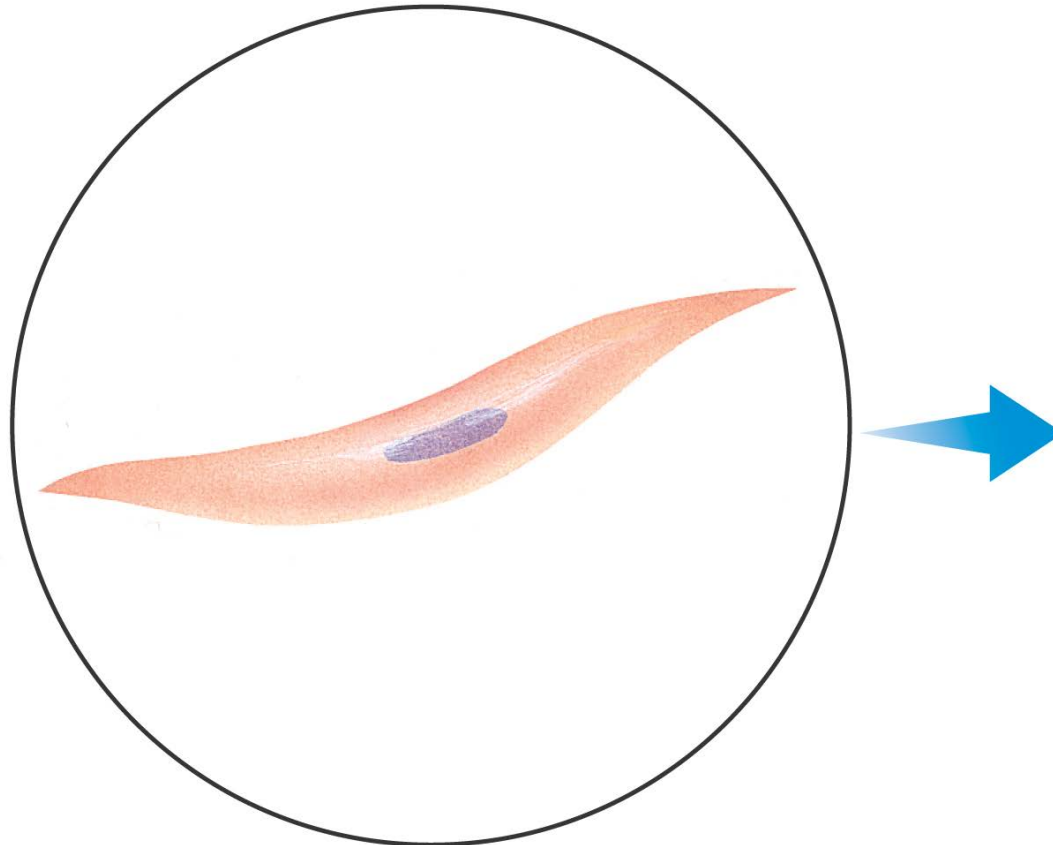


Digestive system



In multicellular organisms, cells are the first level of organization.

Muscle cell

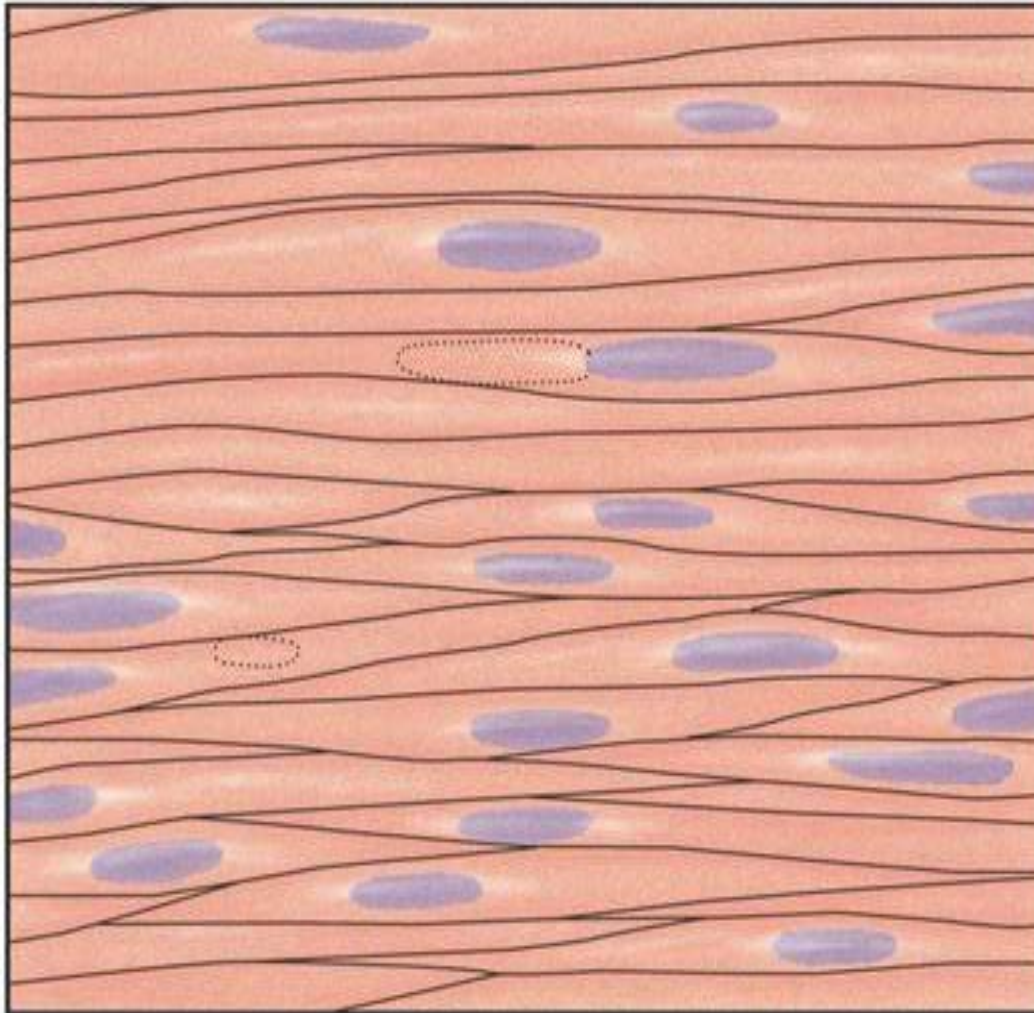


Tissues

Similar cells are grouped into units called tissues.

A **tissue** is a group of similar cells that perform a particular function.

Smooth muscle tissue



Most animals have four main types of tissue:

- muscle
- epithelial
- nervous
- connective

Organs

Organs are groups of tissues that work together to perform a specific function.

Stomach



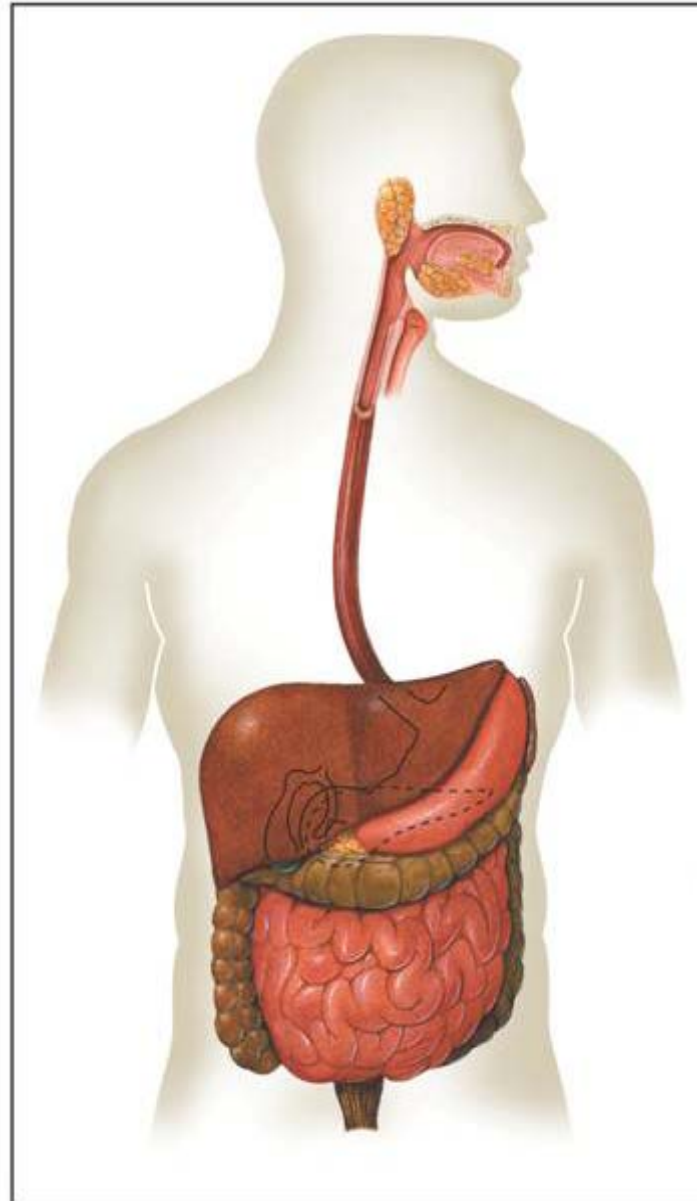
Organ Systems

In most cases, an organ completes a series of specialized tasks.

A group of organs that work together to perform a specific function is called an **organ system**.

7-4 The Diversity of Cellular Life → Levels of Organization

Digestive system



7-4 Section QUIZ

Continue to:

Section QUIZ

- or -

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7-4 Section QUIZ

1 Cell specialization is characteristic of

- a. bacteria.
- b. all unicellular organisms.
- c. yeasts.

A d. multicellular organisms.

7-4 Section QUIZ

2 Which of the following cells is specialized for contraction?

A

a. muscle cell

b. red blood cell

c. pancreatic cell

d. nerve cell

7-4 Section QUIZ

3 The stomach is an example of a(an)

a. tissue.

A b. organ.

c. organ system.

d. organism.

7-4 Section QUIZ

4 Which of the following shows the levels of organization in an organism from the simplest to the most complex?

a. organ system, organ, cell, tissue

b. tissue, cell, organ, organ system

A c. cell, tissue, organ, organ system

d. cell, organ, tissue, organ system

7-4 Section QUIZ

5 Which of the following would probably contain the greatest variety of specialized cells?

a. an organ system

b. a tissue

c. an organ

A d. a multicellular organism

END OF SECTION