

7-4 The Diversity of Cellular Life

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

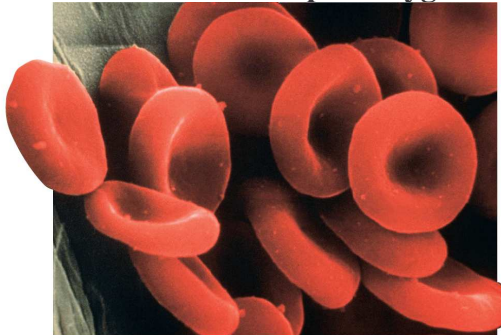
Organisms that are made up of many cells are called multicellular.
There is a great variety among multicellular organisms.

Cells throughout an organism can develop in different ways to perform different tasks.
This process is called **cell specialization**.

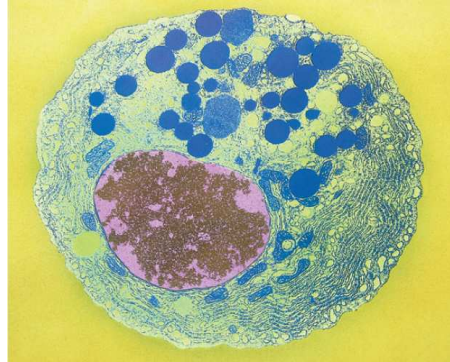
Specialized Animal Cells

Animal cells are specialized in many ways.

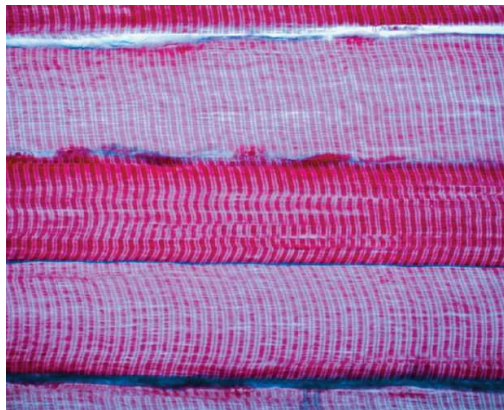
Red blood cells transport oxygen.



Cells in the pancreas produce proteins.



Muscle cells allow movement.

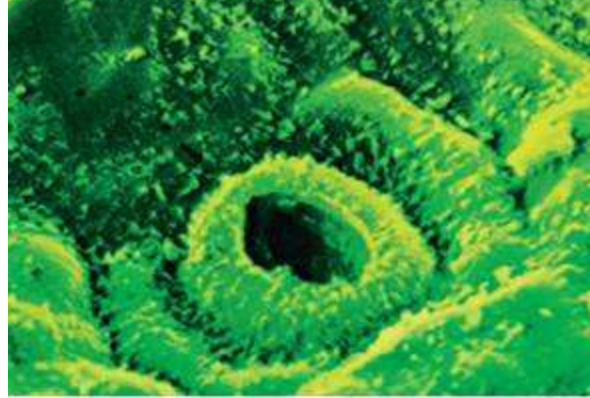


Specialized Plant Cells

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.

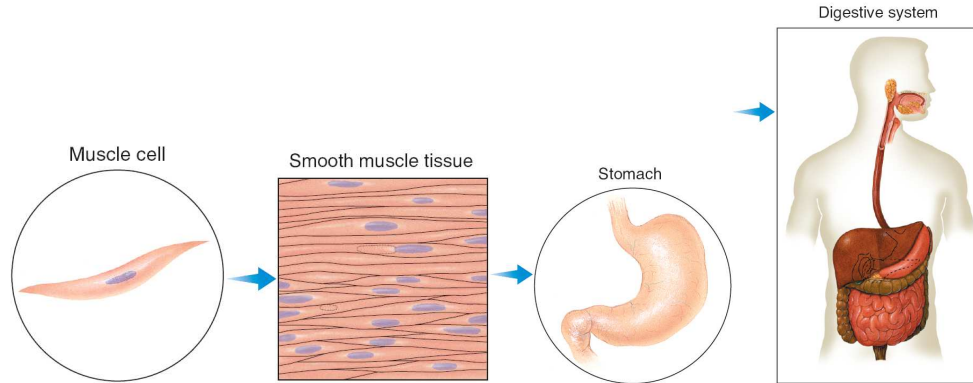
Stomata enclosed by guard cells.



Levels of Organization

The levels of organization in a multicellular organism are:

- individual cells
- tissues
- organs
- organ systems



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

Tissues

Similar cells are grouped into units called tissues.

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

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.

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**.