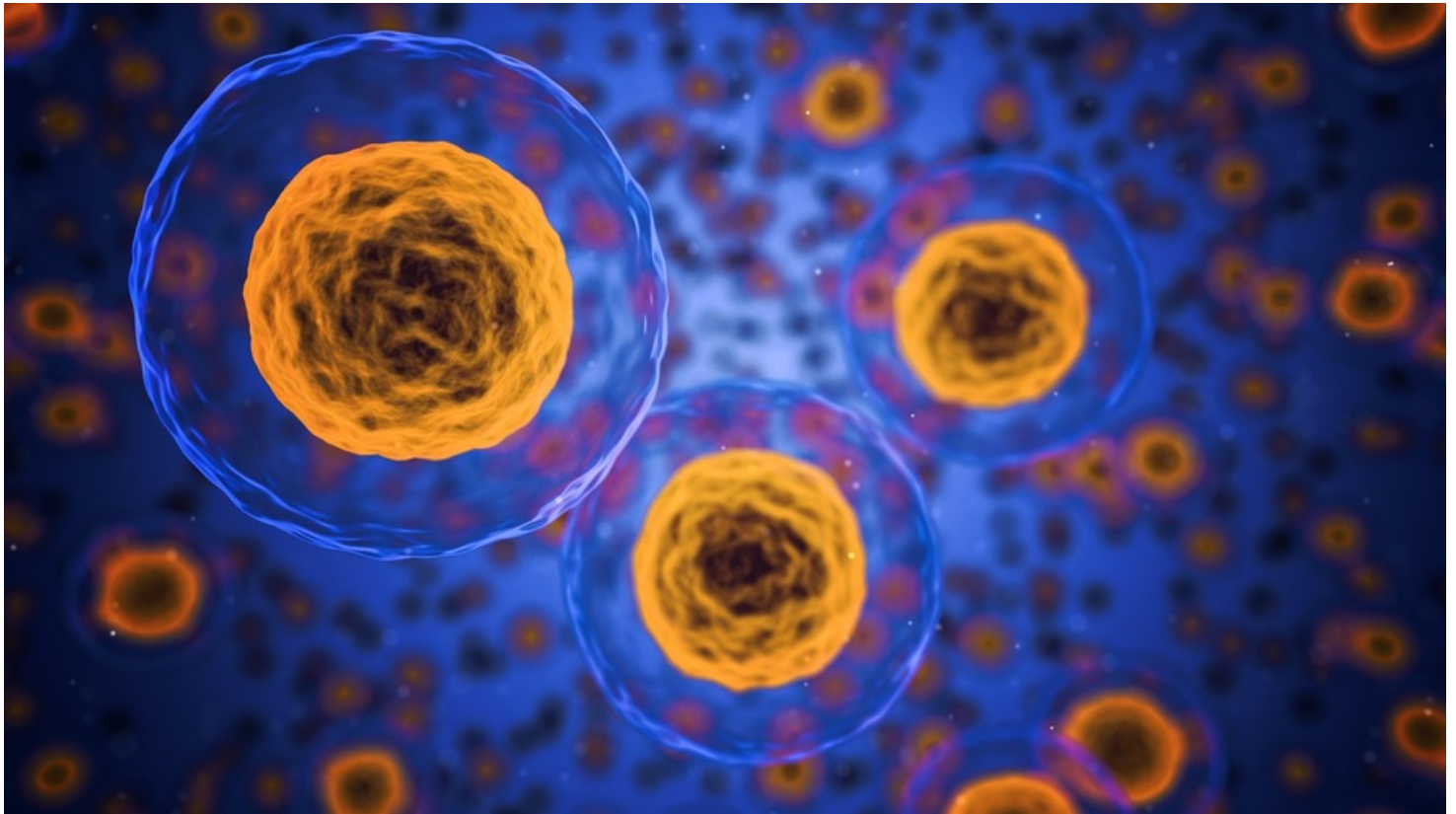


# The facts about cells

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An image of cells. Photo from Pixabay.

Cells are the basic building blocks of life. All living things, or organisms, are made of cells.

Some life forms are made of a single cell. But humans have up to 100 trillion cells in their bodies. That is about 1,000 times the number of stars in our galaxy!

There are hundreds of different types of cells. They give our bodies their shape, give us energy, let us have children and much more.

Below are 10 facts about cells. Some are well-known, but others may surprise you.

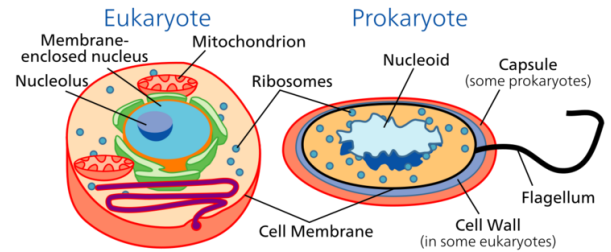
## **1. Cells are too small to see without a microscope.**

Cells come in many sizes. They can be anywhere from 1 to 100 micrometers. A micrometer is very small. It takes more than 25,000 micrometers to fill a single inch.

The study of cells is called cell biology. Almost all cells are too small to see with just a person's eyes. This is why cell biology would have been impossible without a microscope. By using this tool, scientists can zoom in and see what cells look like.

## 2. There are two main types of cells.

Cells can be either eukaryotic or prokaryotic. Eukaryotic cells have a nucleus in the middle. A nucleus is an area that stores DNA. It is surrounded by a kind of skin called a membrane. Animals and plants have eukaryotic cells, and are called eukaryotes.



Prokaryotes are tiny creatures made of just one prokaryotic cell. Prokaryotic cells don't have a nucleus with a membrane. Instead, they have an open area called nucleoid. Bacteria and archaeans are examples of prokaryotes.

## 3. Prokaryotes were the earliest and most basic forms of life on Earth.

Prokaryotes can survive in places where other organisms can't. Some archaeans even live inside animals. Others live in hot springs, swamps and wetlands.

## 4. There are more bacteria in the body than human cells.

Some scientists have found that there are more bacteria in a person's body than human cells. These bacteria actually work to help our bodies. For example, they help our stomachs break down food.

## 5. Cells contain DNA.

Cells carry DNA and RNA, the information building blocks that tell them how to work. DNA and RNA are known as nucleic acids.

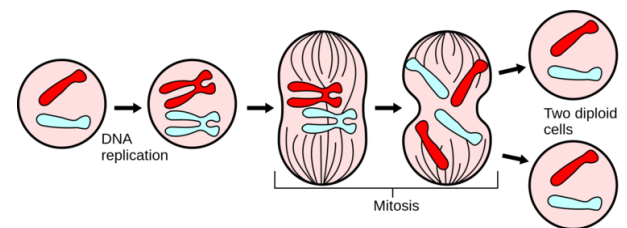
In prokaryotic cells, DNA is in the nucleoid. In eukaryotic cells, it is in the nucleus. DNA forms long chains called chromosomes. These tell an organism how to grow and look. Human cells have 23 pairs of chromosomes, for a total of 46.

## 6. Cells have organelles with specific roles.

Organelles are parts of a cell that have a certain role. For example, mitochondria are like a motor: they make energy. The endoplasmic reticulum is like a kitchen: it makes carbohydrates, like sugar, and fats. Lysosomes are like a bathroom: they help cells break down what they eat.

## 7. Cells have various ways of reproducing.

Cells can make copies of themselves. Most prokaryotic cells do this through binary fission. In binary fission, a single cell splits into two new cells just like it.



Eukaryotic cells can also split in two. For eukaryotic cells, this is called mitosis. Larger eukaryotic organisms, like animals, can also create new versions of themselves. First, they make two different cells, called gametes. Making gametes is called meiosis. Then, these two gametes come together and make a new life.

## 8. Groups of cells form tissues.

Tissues are groups of cells with the same type and the same role. Different types of tissues can also come together to form organs. An organ is a part of the body with a certain role, like lungs or the heart.

### **9. Cells have different lifespans.**

Different cells can live for different amounts of time. They can live anywhere from a few days to a year. Brain cells can last for a whole lifetime.

### **10. Cells can destroy themselves.**

When a cell becomes damaged or infected, it will self-destruct. This is called apoptosis. Apoptosis keeps one damaged cell from harming the rest of the body. But, if a cell has cancer, it is not able to destroy itself. It might keep making copies of itself, which is how cancer spreads.

## Quiz

1 Read the paragraph from the section "1.Cells are too small to see without a microscope."

*The study of cells is called cell biology. Almost all cells are too small to see with just a person's eyes. This is why cell biology would have been impossible without a microscope. By using this tool, scientists can zoom in and see what cells look like.*

Which phrase helps you understand the meaning of "microscope"?

- (A) too small
- (B) cell biology
- (C) person's eyes
- (D) zoom in

2 Read the paragraph from the section "5. Cells contain DNA."

*In prokaryotic cells, DNA is in the nucleoid. In eukaryotic cells, it is in the nucleus. DNA forms long chains called chromosomes. These tell an organism how to grow and look. Human cells have 23 pairs of chromosomes, for a total of 46.*

What do "chromosomes" refer to?

- (A) the nucleoids found inside of eukaryotic cells
- (B) the material inside of the nucleus of a prokaryotic cell
- (C) the links of DNA found in eukaryotic cells
- (D) the links of DNA found in prokaryotic cells

3 Read the section "2. There are two main types of cells."

Based on the image and information in that section, what do we know about the similarities between eukaryotes and prokaryotes?

- (A) Both are cells that share some of the same parts.
- (B) Both have cell membranes and capsules.
- (C) Both have a nucleus to keep DNA in the cell safe.
- (D) Both are used to create larger creatures.

4 Examine the image in the section "7.Cells have various ways of reproducing."

HOW does this image help you better understand mitosis?

- (A) by comparing and contrasting mitosis and meiosis
- (B) by showing three generations of the same cell
- (C) by showing what is happening to the cell in each step of the process
- (D) by comparing the two new cells with the original cell that they came from