Discovery of Cells - Advanced

Douglas Wilkin, Ph.D.
Niamh Gray-Wilson

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What was needed to discover the cell?

The microscope of course. Objects that were too small to be seen with the human eye were unknown until the microscope was developed. Once this instrument was developed, a whole new field of science was initiated.

Discovery of Cells

If you look at living organisms under a microscope you will see they are made up of cells. The word cell, derived from the Latin word cellula meaning small compartment, was first used by Robert Hooke, a British biologist and early microscopist. Hooke looked at thin slices of cork under a microscope. The structure he saw looked like a honeycomb as it was made up of many tiny units. Hooke’s drawing is shown in Figure 1.1. In 1665 Hooke published his book Micrographia, in which he wrote:

... I could exceedingly plainly perceive it to be all perforated and porous, much like a Honey-comb, but that the pores of it were not regular.... these pores, or cells, ... were indeed the first microscopical pores I ever saw, and perhaps, that were ever seen, for I had not met with any Writer or Person, that had made any mention of them before this...

During the 1670s, the Dutch tradesman Antony van Leeuwenhoek, shown in Figure 1.2, used microscopes to observe many microbes and body cells. Leeuwenhoek developed an interest in microscopy and ground his own lenses to
make simple microscopes. Leeuwenhoek was so good at making lenses that his simple microscopes were able to magnify much more clearly than the compound microscopes of his day. His microscope’s increased ability to magnify over 200x is comparable to a modern compound light microscope. Compound microscopes, which are microscopes that use more than one lens, had been invented around 1595 by Zacharias Jansen, a Dutch spectacle-maker. Several people, including Robert Hooke, had built compound microscopes and were making important discoveries with them during Leeuwenhoek’s time.

Fortunately, Leeuwenhoek took great care in writing detailed reports of what he saw under his microscope. He was the first person to report observations of many microscopic organisms. Some of his discoveries included tiny animals such as ciliates, foraminifera, roundworms, and rotifers, shown in Figure 1.3. He discovered blood cells and was the first person to see living sperm cells. In 1683, Leeuwenhoek wrote to the Royal Society of London about his observations on the plaque between his own teeth, "a little white matter, which is as thick as if ’twere batter." He called the creatures he saw in the plaque animacules, or tiny animals. This report was among the first observations on living bacteria ever recorded.

**Summary**

- Before the development of microscopes, the existence of cellular life was unknown.
- By examining a piece of cork, Robert Hooke first saw and named cells.
- Antony van Leeuwenhoek was the first person to see living cells.

**Review**

1. Describe the contributions of Hooke and Leeuwenhoek to cell biology.
Antony van Leeuwenhoek (1632-1723). His carefully crafted microscopes and insightful observations of microbes led to the title the “Father of Microscopy.”

A rotifer, the microscopic organism Leeuwenhoek saw under his microscope.
2. What enabled Leeuwenhoek to observe things that nobody else had seen before?

Explore More

Use this resource to answer the questions that follow.

1. How did Hooke first observe cells?
2. What did Leeuwenhoek look at through his microscope?

References

1. Robert Hooke, Micrographia, 1665. Suber cells and mimosa leaves. Public Domain