

## Cell Division

### Historical Perspective

All things whole are made up of parts and in science we look at the smallest part and determine how they fit together to make up the whole. When studying elements in chemistry it was determined that the smallest particle of such an element is an atom, which consists of electrons centered around a nucleus of protons and neutrons. When studying matter in physics it was determined that atoms are not the smallest unit of matter. Particles called quarks and leptons are the atoms building blocks.

Studying biology is no different. In 1838 while studying plants, Matthias Scheiden's concluded that all plant tissues are composed of cells and that an embryonic plant arose from a single cell. One year later Theodor Schwann reached the same conclusion while studying animal cells. In 1855 Rudolf Virchow was able to add a third part to the cell theory that all cells come from preexisting cells and not from spontaneous generation.

The Cell Theory states:

1. All living organisms are composed of cells. They may be unicellular or multicellular
2. The cell is the basic unit of life
3. Cells arise from pre-existing cells.

It wasn't until 1878 when the process of how cells arise from preexisting cells was determined. In 1878, Walter Flemming published his findings and concluded that cells divide in a process he called mitosis. He is also the first scientist to describe chromosomes.

Oscar Hertwig discovered meiosis in 1876 and described it for the first time using sea urchin eggs. In 1883, at the level of chromosomes it was described again by Edouard Van Beneden, using roundworm eggs.