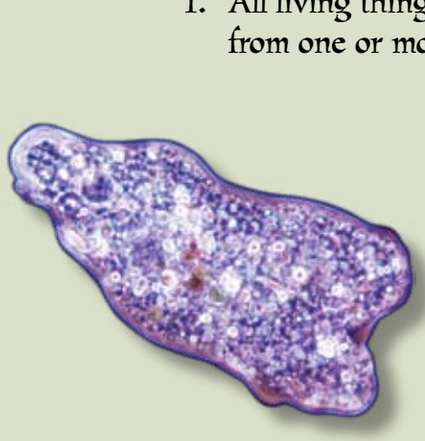
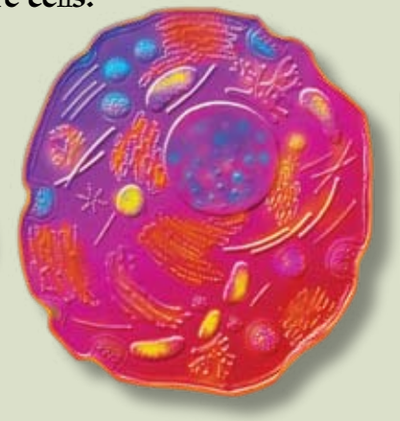
Cell Theory

1. All living things are made from one or more cells.



single-celled organisms



animal cell

plant cell

2. The cell is the basic unit of life.

cell cross-section

3. All cells come from preexisting cells.

cell replication

Fast forward almost 200 years. Three scientists were working on cells at about the same time. Their names were Matthais Schleiden (mah-TEE-ahs SHLAHYD-n), Theodor Schwann (TEY-oh-dawr shvahn), and Rudolf Virchow (ROO-dawlf FIR-koh). Together, their work became known as **Cell Theory**.

Schleiden worked with plant cells. Schwann worked with animal cells. One night, they had dinner together. They talked about their work. They realized that the cells they both studied were very similar. Plants and animals were both made of cells.

They went to the laboratory and looked at cells. Then they published their findings in 1839. They said two important things. First, all living things are made of cells. Second, cells are the smallest part of a living thing that is itself alive.

The one thing that they weren't sure of was where cells came from. Almost 20 years later, Rudolf Virchow solved the puzzle. Cells, he said, come from other cells. This became the third part of Cell Theory.

Matthias Jakob Schleiden (1804–1881)

Matthias Jakob Schleiden was born in Germany. He was a botanist. However, botany was not his first career. He earned a law degree first. Then, he practiced law. Studying plants was at first only a hobby for Schleiden. He chose to use a microscope to study plant parts. He discovered that plants are made of cells. This discovery was the beginning of what is now known as **Cell Theory**. The cell theory consists of three main parts. His discovery was the beginning of the first part. That is, all plants are made of cells.

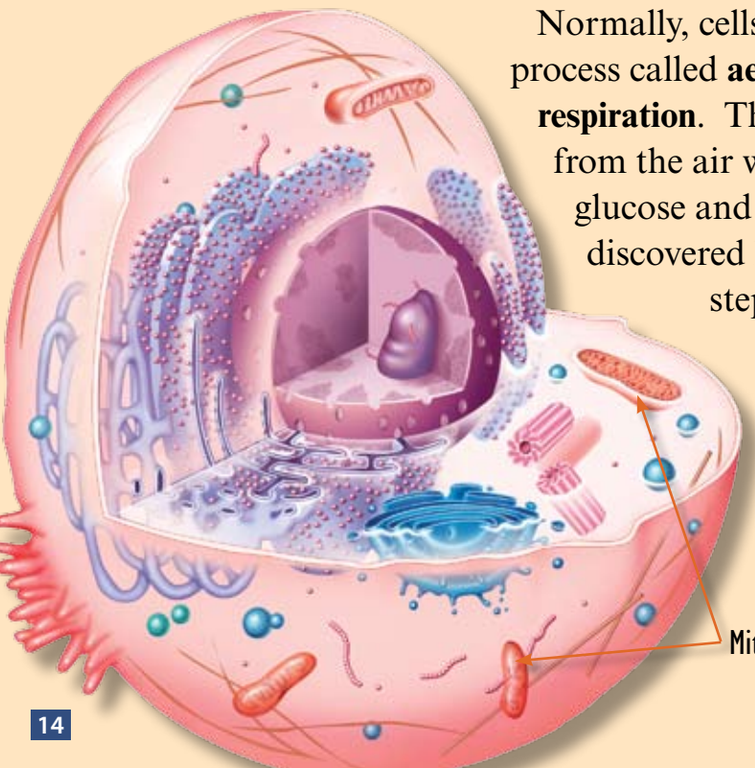
Hans Adolf Krebs (1900–1981)

Hans Adolf Krebs was born in Germany. He was the son of a Jewish doctor. He went to school to become a scientist. He specialized in biochemsitry. That is the study of how molecules interact inside living things.

In 1933, Hitler and the Nazi party took over Germany. They made it illegal for Jews to work as doctors. Krebs left the country. He continued his work in Britain.

The work paid off. Krebs figured out how cells turn glucose, or sugar, into energy the cells can use. Krebs won the Nobel Prize with his research partner.

Cells need energy. They use energy to work, to repair themselves, and to create new cells. They get that energy from a molecule called glucose.



Normally, cells use glucose in a long process called **aerobic** (ai-ROH-bik) **respiration**. This process requires oxygen from the air we breathe. The cell takes glucose and slowly pulls it apart. Krebs discovered how the cell performs each step of taking apart glucose. He called it the Krebs Cycle.

Each time the cell pulls a chunk off of the glucose molecule, energy is released. That energy is stored in a molecule called ATP. The aerobic respiration process produces 38 ATP from one glucose molecule!

Mitochondria are where aerobic respiration occurs.

Aerobic respiration is slow. It also requires lots of oxygen. Sometimes your body needs energy fast. Sometimes it doesn't have enough oxygen. Then it needs to do something different. It can't use the Krebs Cycle.

Knighthood

Krebs was knighted in the United Kingdom. **Knighthood** is awarded for public service and contributions to the nation.

Krebs Cycle