sea urchin

Weismann studied sea urchins. They are multicellular organisms. He believed they are made of two kinds of cells. He thought they were made of germ cells and body cells. Germ cells pass along genetic information to offspring. Egg and sperm are germ cells. Body cells perform the work needed to keep the organism alive.

He realized that germ cells must join to create offspring. So each germ cell could only have half the number of chromosomes found in the body cells. He named this division of sex cells **reduction division**. It is now called **meiosis** (my-OH-sis).

Other people started looking at his work. This led them to return to the work of another scientist. They started to look at Gregor Mendel's work. He was a pioneer in the study of **genetics**.

This illustration from the late 1800s shows the characteristics with which Mendel worked.

Gregor Mendel

Gregor Mendel (MEN-duhl) was an Austrian monk who loved nature. He lived from 1822 to 1884. Mendel grew nearly 28,000 pea plants. He tested them to learn how plants pass traits to their offspring. He found that each new pea plant had different combinations of traits. His findings led to the study of genetics. Scientists did not realize how important Mendel's ideas were until the 20th century.

Gene Troubles

There are many genetic disorders. There is even one that makes people smell like rotting fish!

Joan Wright Goodman
(1925–2006)

a bone marrow transplant

Joan Wright Goodman was born in El Paso, Texas. She lived there until the age of 16, when she went to college in New York. She earned her degree in chemistry and then her doctorate degree. While there, she met her husband, a **physicist**. Together they moved to Tennessee and had two children.

Goodman was the first to show that stem cells from bone marrow flow in the blood of mammals. This paved the way for current research on stem cells. A stem cell is a master cell. It can become any type of cell in the body.

Goodman studied bone marrow transplants. She researched their effects at fighting damage from **radiation**. She also studied immune response in cells.

Number of Chromosomes

Humans have 46 chromosomes. Fruit flies have eight. You might think this is because humans are more complex than fruit flies. But crayfish have 200 chromosomes. And giant sequoia trees have 22.

chromosome

Thomas Hunt Morgan
(1866–1945)

In the 1900s, many scientists began to study chromosomes. They studied what happens during cell division. Thomas Hunt Morgan was an American scientist. He studied the chromosomes of fruit flies. Scientists like to use fruit flies in their experiments. Fruit flies have just eight chromosomes. They are easy to study under a light microscope. This makes the scientists' complicated work easier to manage.

Morgan developed the idea that chromosomes carry **genes**. The genes provide the blueprint to pass traits to offspring. He also identified special chromosomes. He named them X and Y.