

FACT SHEET

Stem Cell Discovery

In 1998, Dr. James Thomson of UW–Madison became the first scientist to isolate human embryonic stem cells. Since that time, UW–Madison has become a world leader in human embryonic stem cell research.

Stem cells possess two characteristics that distinguish them from other types of cells. First, they are “unspecialized” cells that can become cells with special functions such as muscles or organs. Second, they renew themselves indefinitely through cell division. Some stem cells are isolated from fully formed tissue. These are referred to as adult stem cells. Other stem cells come from human embryos. These are known as human embryonic stem cells.

Human embryonic stem cells have two unique qualities that distinguish them from adult stem cells. Unlike adult stem cells, embryonic stem cells are able to develop into most of the 220 types of cells that make up the human body, making them a promising means to develop new treatments and cures for a variety of diseases. They also have the ability to reproduce indefinitely in culture, making it possible for researchers to obtain large quantities of the cells for study. Basic studies of human embryonic stem cells, which provide insights into the earliest stages of human development, offer the promise of a vastly improved understanding of the human body.

At UW–Madison, more than 30 research groups involving more than 80 scientists are studying human embryonic stem cells. Scientists seek to understand how stem cells become specialized cells and are pursuing long-term efforts to give doctors the ability to replace damaged cells with healthy ones or offer new preventive therapies. Research includes work to develop brain cells; heart cells; and insulin-producing cells from embryonic stem cells to treat diseases such as Parkinson’s and ALS, heart disease and diabetes. UW–Madison researchers have published [more than 70 studies](#) relating to stem cells in prestigious scientific journals.

The Wisconsin Alumni Research Foundation (WARF) holds the patents that govern human embryonic stem cell technology. The nonprofit WiCell Research Institute, established in 1999 as a subsidiary of WARF to advance human embryonic stem cell science, has five lines that qualify under federal guidelines for stem cell research, representing nearly 25 percent of the lines listed on the National Institutes of Health Stem Cell Registry. In 2005, WiCell was awarded a contract by the National Institutes of Health to host the National Stem Cell Bank.

WiCell is committed to advancing progress and collaboration in human embryonic stem cell research and unlocking the therapeutic potential of the field. Since its inception, WiCell has fulfilled more than [914 licenses for stem cells, which have been shipped to more than 563 researchers in 25 countries and 40 states](#). As the National Stem Cell Bank, WiCell also distributes the NIH-registry cell lines that have been deposited to researchers around the world.