

BRF Stem Cell Newsletter

Bedford Research Foundation

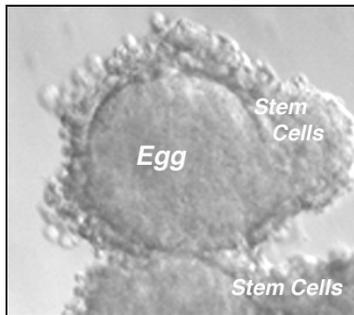
Spring, 2004

Mouse eggs develop from embryonic stem cells in the BRF laboratory

BRF scientists were successful in their first attempt to repeat the ground-breaking work of Dr. Hans Scholer, the Keynote Speaker at the BRF Activated Egg Symposium in Nov, 2003. He described the development of mouse eggs from stem cells in his University of Pennsylvania laboratory. Although the eggs were not entirely normal, the important possibility of increasing the supply of eggs for research by developing them from laboratory stem cells prompted BRF scientists to attempt to reproduce the work.

Dr. Lisa Fitzgerald, an expert in mouse bone marrow stem cells, was recruited in January, 2004, to head up the effort. Within ten weeks, immature eggs formed in Fitzgerald's stem cell cultures.

"It was truly amazing to discover the huge egg cells nestled among the clusters of tiny stem cells floating in the petri dish," said Dr. Ann Kiessling, BRF director. "This achievement means we can immediately begin to test the ability of eggs developed from stem cells in the laboratory to remodel adult cell nuclei, and then undergo activation to give rise to new pluripotent stem cells. Dr. Scholer showed that the laboratory mouse eggs are not normal, but they may be capable of creating stem cells. If so, this provides a new approach to developing more



efficient methods of deriving pluripotent stem cells from adult cells" said Kiessling, "and is a valuable adjunct to our unique human egg donor program. We're very excited about our research results, and we're moving forward as fast as our resources allow."

Cibelli co-authors report of first human stem cells from nuclear transplantation

Dr. Jose Cibelli, Michigan State University Professor and a trustee of the Bedford Research Foundation, collaborated with Korean researchers to characterize the first human stem cells developed by transplanting genetic material from an adult cell into a human egg.

Sixteen Korean women donated 176 eggs to Drs. Hwang and Moon for stem cell research. The

genetic material in the eggs was removed, replaced with genetic material in the nucleus of an adult cell recovered from the women's ovaries along with the eggs, and the reconstructed eggs were activated artificially. These techniques were originally reported by Dr. Cibelli in 2001, using 26 eggs from the BRF egg donor program, before he moved to Michigan.

One of the 176 reconstructed Korean eggs developed into stem cells. Drs. Hwang and Moon asked Dr. Cibelli to help characterize the stem cells to meet the requirements for publication in SCIENCE. The

Korean report is a major advance to the development of stem cells for all patients in need.

The news was met with some concern because the Bush administration has denied federal funding for this type of stem cell research. Americans may be faced with seeking important stem cell therapies from other countries. To avoid the loss of stem cell technology, the research must be privately funded in the U.S. To ensure the safety of the donors, each BRF experiment with human eggs costs approximately \$60,000.

Harvard University announces plans for a Stem Cell Institute

In a bold move to circumvent the federal moratorium on stem cell research, Harvard announced it plans to raise over 100 million dollars for an interdisciplinary stem cell research institute. The details of the Institute are under development.

Dr. Ann Kiessling, BRF director and a member of the Harvard Medical School faculty, is considering the possibility of a BRF collaboration with the Harvard Institute. "Our egg donor program is a unique and valuable resource. Because BRF is a small public charity, BRF research has much lower overhead costs than a large university such as Harvard. For each dollar donated to BRF, 94% directly supports experiments. That percentage is much lower for large institutions. But if a collaboration with the Harvard Stem Cell Institute would push BRF research goals forward faster, we will consider it," said Kiessling. "In the meantime, we're moving forward on our own, and trying to raise the funds needed to keep our human egg donor research at the forefront."

Question:

What is "activating" an egg?

Answer:

An egg is a huge cell with stockpiles of enzymes and nutrients; it requires stimulation to become active and subdivide into smaller, totipotent cells. Either sperm or chemicals can trigger egg activation.

BRF RESEARCH GOALS:

The goal of our research is to create stem cells specifically for each patient in need. Pluripotent stem cells derived from unfertilized eggs have more therapeutic value than stem cells from discarded embryos.

BRF scientists are also developing methods to change stem cells into the specific cells needed to treat the patient's disease.

HOW YOU CAN HELP:

Raise funds to support the Foundation's urgently needed research. Contact us for promotional materials and more information about our current initiatives. 617-623-5670
www.bedfordresearch.org

Help prevent the US Congress from outlawing our research with unfertilized, activated eggs.

Conducting urgently needed stem cell research

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STEM CELL RESEARCH UPDATE

NEWS ON RECENT PROGRESS TOWARDS CURING:

- Heart failure
- Spinal cord injury
- Diabetes
- Parkinson's disease
- Osteoarthritis
- Alzheimer's disease
- Blood disorders
- AIDS

