BEDFORD
RESEARCH FOUNDATION
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Innovative Stem Cells For *Every* Body

Bedford Research scientists are launching studies to derive new stem cells from *unfertilized* human eggs. These cells, termed "parthenote" stem cells, are being developed to fulfill the need for "off the shelf" stem cell treatments, analogous to blood banks.

The past decade of discoveries by BRF scientists provide the ground work for the new research initiative. Parthenote stem cells have the potential to develop into all the types of cells needed for therapies: neurons, heart muscle, insulin-producing cells, bone marrow and cartilage cells.

New, exciting gene editing technologies have been used successfully by BRF scientists to remove the HIV-receptor (the protein on the cell surface the virus uses to infect the cell) in mouse eggs as a model system. These recent results pave the way to continue the work in human eggs to create parthenote stem cells resistant to infection by HIV, offering the possibility of a cure for HIV/AIDS. The proof of principle of this approach was reported several years ago when an HIV-infected man was cured following a bone marrow transplant with stem cells from a person naturally missing the receptor for HIV.

Dr. Joel Lawitts microinjecting gene editing enzymes into mouse eggs at Spring 2015 Open House

The same gene editing technology can also be used to decrease stem cell rejection after transplantation, for example, at the site of a spinal cord injury to help prevent permanent paralysis. Stem cells that could be universally accepted for "off the shelf" treatments of acute spinal cord injury, heart attack or stroke are the goals of the research.

BRF scientists believe that a bank of stem cells will not only be valuable treatments for acute injuries, but also for chronic conditions, such as diabetes, Parkinson's Disease, Alzheimer's Disease and chronic spinal cord injury. Such stem cell lines are also proving to be valuable models for understanding the development of cancers, such as prostate cancer and leukemia.

Oct 28, 2015, our research fellow, Sebastian Bernabe, collaborating in Andalusia, Spain, performed the *world's first* transfer of another innovative type of stem cell, termed "induced pluripotent" stem cell into the spinal cord of an injured rat as a model system. Outcomes will be known in 2016.

Important note: *To develop parthenote stem cells, BRF scientists will need human eggs donated for research, a controversial topic. The first such donation has been made recently by a generous women who had her eggs frozen several years ago.*

MORE NEWS INSIDE **FALL 2015 - WINTER 2016**

Prostate Disease Research Update
Expanding study subjects to help develop a better screening test for prostate cancer.

New Board Members and Spinal Cord Injury Research *The Foundation adds exciting talent and receives news of research from Spain.*

Donate to the Foundation
Your donations are essential for our research to continue.

From the Director:

On twenty years of progress…

With the help of generous philanthropists and medical collaborators, I founded the Bedford Research Foundation in 1996 to address a research need that could not be federally funded — how to help men infected by HIV through tainted blood transfusions have children without infecting their wives and babies.

Dr. Ann Kiessling and Ryan Schlosser, July, 2015

The first "Special Program for Assisted Reproduction" baby was born in 1998. Ryan Schlosser, now 16 years old, visited the Bedford Research lab last summer. As of September, 2015, 246 "SPAR" babies have been born with all moms and babies testing negative for HIV.

In 1999, we responded to another research need that could not be federally funded — the derivation of stem cells from unfertilized human eggs. Bedford Research scientists spear-headed the world's first ethics advisory board and medical team charged with the task of developing the "gold standard" for women volunteering to donate their eggs for research.

To be clinically feasible, at least 10% of activated, unfertilized human eggs must successfully develop into stem cells. When initial experiments failed to reach this goal, Bedford Research scientists collaborated with colleagues in Greece to discover what genes must be activated in unfertilized eggs to reach the 10% efficiency needed. Our results, published in three landmark reports, have led to the information needed to resume the research. As described in the cover story, the work will need eggs donated by women for research, a controversial topic being considered by BRF ethicists.

…cont'd on page 3

Bedford Research Open Houses Celebrate New Facility

Two open houses were held in the spring to accommodate biotech and healthcare business and the general public. The ribbon cutting (outside cover) was officiated by Representative Ken Gordon and Senator Mike Barrett, and was followed by poster presentations on projects currently underway. Dr. Joel Lawitts of Beth Israel Deaconess Medical Center and Dr. Fred Davis of Northeastern University presented their research to a full house. The events exceeded the foundation's expectations, with over 100 attendees representing local government, businesses, residents and media. New England Nurseries and Whole Foods Bedford supported the event with generous donations.


Mouse egg being injected to delete HIV receptor

"Dr. Kiessling and her staff have shown their determination to tackle some of the most difficult health problems of our time and it is exciting that their work will now continue in Bedford."

- Representative Ken Gordon

Prostate Disease Research Update

Patient recruitment into the prostate cancer screening project is ongoing, and Bedford Research Scientists have developed methods for including specimens submitted to the laboratory for other types of testing. The goal of the project is to develop semen screening tests that improve diagnosis and staging of prostate cancer as well as reflect overall male health. Urologists from around the country have joined the research.


Dr. Robert Eyre

Community Consulting Teams Studies Bedford Research

Over the past year BRF worked with ***Community Consulting Teams*** on a strategic assessment to improve communication about BRFs mission and needs. BRF was selected for CCT's services from among more than a 100 other nonprofit organizations. The study concluded: BRF has an impressive 19-year track record as a successful independent research organization pioneering techniques and innovation. Since research landscape is shifting toward non-traditional models, BRF is well positioned to strengthen its financial resources and build upon its position in the research community.

Meet Our New Board Members!

The Bedford Research Foundation welcomes three new board members to the Board of Trustees: Larry LaFranchi, Ellen Sheehy and Scott Anderson.

Mr. LaFranchi brings more than 30 years of business and entrepreneurial experience. His passion for health care is a perfect match for the Foundation's independent research goals, and his expertise in financial planning and consulting will benefit all aspects of research planning.

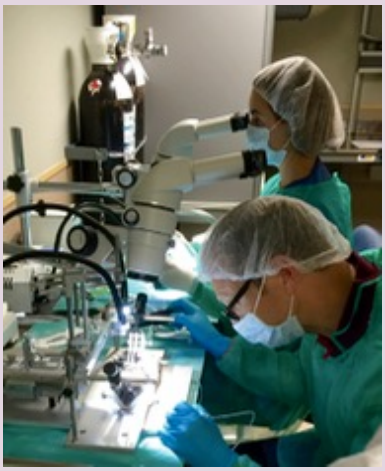
Ms. Sheehy is an experienced, analytical entrepreneur with broad experience in strategy development and implementation. She has been a leader in the field of nonprofit healthcare for many years.

Mr. Anderson is an experienced computer developer and technical science writer. He co-authored Human Embryonic Stem Cells with Dr. Kiessling.

From the Director, cont'd

The human egg research MUST be privately funded. Due to the National Institutes of Health budget (the Dickey Amendment), no federal dollars can be used to study activated human eggs or parthenote stem cells. BRF is uniquely positioned to push this field forward, and needs to add two additional scientists in 2016 to optimize progress. ***Progress depends entirely on private donations.***

Research Update



Dr. Bernabe and staff in Andulacia, Spain

In 2015, BRF helped sponsor a research fellow, Sebastian Bernabe, in Andulacia, Spain's new stem cell research center. Formerly a research fellow with at Michigan State University, Dr. Bernabe joined the spinal cord research team developed with Spanish scientists by Dr. Jose Cibelli and Dr. Philip Horner. The goal of the research is to test the safety of another innovative stem cell, "induced pluripotent stem cells (iPS cells)," derived from skin biopsies, to treat spinal cord injury in a rat model system. The transplant performed Oct 28, 2015 is the result of several years of research. It will take months to know the outcomes.

Donate Today

"I am proud and excited to have such ground breaking research in our town. Bedford Research scientists are developing stem cells from eggs, not from embryos, thus bypassing many of the ethical dilemmas associated with stem cell research."

-Sen. Michael J. Barrett
State Senator, Bedford, MA.

Philanthropy Is The Key To Continued Progress

The average cost of each experiment is $90,000. Because much of our overhead is covered by fee-for-service laboratory tests, every dollar you donate goes directly toward these experiments. This innovative funding model allows Bedford Research scientists greater flexibility to move the work quickly in promising new directions. **Maximum progress requires meeting our annual funding goal of $450,000.** ***Please become a supporter and help us do more experiments this year.***

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