

NEWS AND NOTES

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DIRECTOR'S MESSAGE

A VOTE FOR GOOD HEALTH

Michigan election opens new doors to cures



"THE NEW FREEDOM
TO CONDUCT STEM
CELL EXPERIMENTS IN
MICHIGAN WILL
ACCELERATE OUR WORK."

It is a new era for medical research in Michigan. By a healthy margin of 53–47, voters approved a constitutional amendment lifting restrictions on embryonic stem cell research in the state.

Now University of Michigan scientists can join their colleagues in 45 other states in forming new embryonic stem cell lines to study and treat a wide range of diseases, including ALS, nerve damage arising from diabetes, Alzheimer's disease, muscular dystrophies, and other neurological disorders.

The timing couldn't have been better: President Barack Obama has promised to increase federal spending on medical research and to overturn the federal ban on funding new embryonic stem cell lines.

For the Program for Neurology Research & Discovery, this is a major step forward. It gives us the opportunity to do the kind of research we need to understand neurological disease processes and develop successful treatments.

Our initial experiments with embryonic stem cells are promising. We have injected neural stem cells into animals with ALS and observed considerable improvement in their disease.

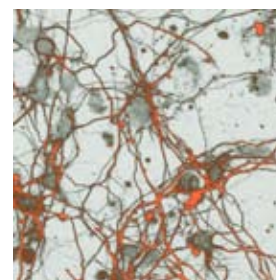
The new freedom to conduct stem cell experiments in Michigan will accelerate our work, hopefully bringing us closer to the day that we can try new therapies on human patients.

Stem cells are only one area where we are making remarkable progress in the laboratory.

We are also:

- Developing gene therapies to carry ALS-fighting genes to patients' nervous systems.
- Fast-tracking new therapies to counteract the damage diabetes inflicts on nerve cells.
- Creating novel animal models to further our understanding of a variety of childhood muscle diseases.

At the Program for Neurology Research & Discovery, we continue to push the envelope of medical knowledge. The 30 medical scientists who work with me in the laboratory are dedicated to applying the latest ideas in neurological science with the ultimate goal of curing disease.



Neural stem cells

I invite you to keep up with developments by visiting our Web site: www.pnrd.umich.edu. Call us with your questions, or see science in action by scheduling a tour.

We truly believe we are on the threshold of great breakthroughs in medicine. We hope you will join us on the journey.

Eva L. Feldman, M.D., Ph.D.
Russell N. DeJong Professor of Neurology
Director, Program for Neurology Research
& Discovery

ON THE THRESHOLD OF DISCOVERY

Research makes huge strides in combating disease

It has been a busy, but exciting, year in our laboratory.

Dr. Feldman and her team of scientists are conducting cutting-edge research on a variety of neurological diseases. They are applying innovative techniques, on the frontiers of medical science, to increase our understanding of diseases and to explore new therapies.

We are on the cusp of discovery and cures.

Here are just a few of our most promising areas of research. If you are interested in learning more about any of this work, please contact us at juneaw@umich.edu.

Stem Cells and ALS

Stem cells are the building blocks of our body, giving rise to every cell type that we have. The potential of stem cells to help our body resist or recover from disease, as well as injury, is a new, exciting area of research.

A hallmark feature of ALS, also known as Lou Gehrig's disease, is the loss of nerve cells that control the ability of a person to speak, breathe, and move. Patients with ALS retain their ability to think and understand; they are fully aware each day as they lose one more body function.

Stem cell technology offers a unique opportunity to maintain the health of nerve cells in patients with ALS. With the passage of Proposal 2 in Michigan, which allows us for the first time to create our own stem cell lines, our plan is to increase dramatically our research efforts in this area.

Our preliminary research shows that animals with ALS retain their ability to move and live longer after they receive stem cell therapy.

We now need to understand:

- What are the stem cells doing in the nervous system?
- Are they making new nerve cells and what do these new nerve cells produce?
- Can they form long connections to sick muscles?
- What is the genetic makeup of these cells?

This promising new work with stem cell lines could have profound implications for other neurological diseases, such as Alzheimer's and Parkinson's disease.

Gene Therapy

The idea behind gene therapy is straightforward: Take a common virus, replace the infectious part of the virus with good genes—and the result is a virus that makes a beneficial protein.

We are using gene therapy to deliver a family of proteins known as growth factors to animals with ALS. Growth factors allow nerve cells to remain healthy even in a hostile environment. Our goal is to discover which of the common viruses are best to use for gene therapy and which growth factor provides the best defense against ALS.

We have panels of viruses and growth factors and an animal model of ALS. The answers from our research can lead to new therapies for ALS, and like our stem cell research, can be then applied to Alzheimer's or Parkinson's disease.

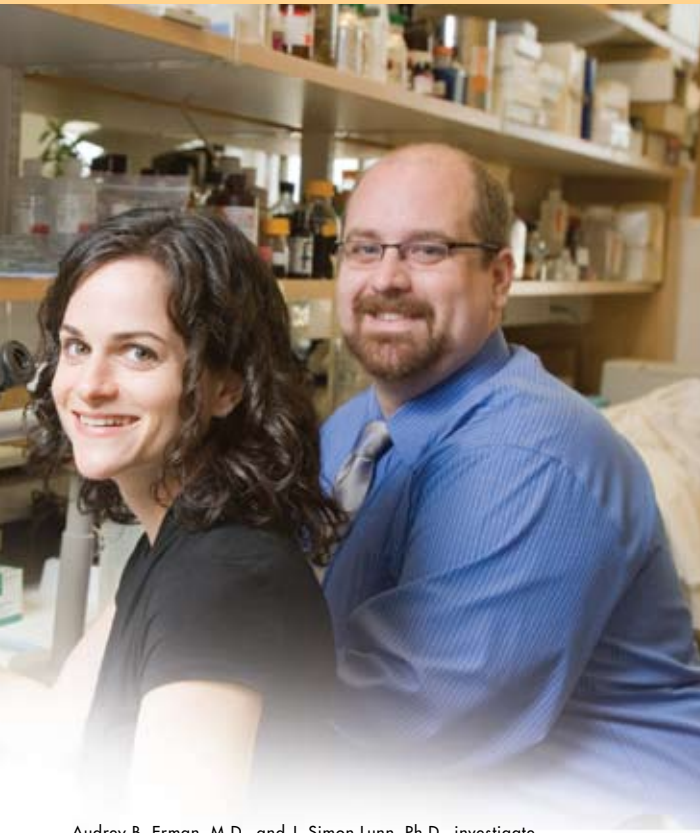
Diabetes

Diabetes is an epidemic in this country. Currently there are more than 20 million Americans with diabetes or pre-diabetes.

The most common complication of diabetes is nerve damage in the feet, which is initially characterized by intense pain, followed over time by numbness, loss of sensation, ulcers, and—in 15 percent of patients—amputations.

We are attacking this huge health problem in many ways. Our scientists are discovering how high blood sugar injures nerves, why this causes pain, and how eventually high blood sugar destroys the nerves.

By both using animals with diabetes and simulating in a Petri dish the insults that nerve cells undergo with diabetes, we have discovered the key pathways of glucose-induced injury and are currently fast-tracking new, groundbreaking therapies.



Audrey B. Erman, M.D., and J. Simon Lunn, Ph.D., investigate innovative ways to treat ALS.

Childhood Muscle Disease

There are more than 40 childhood muscle diseases, known as myopathies, that present at birth. The results can be heartbreaking: children suffering from muscle weakness and a delayed ability to speak, sit, or walk. Often-times, these children are confined to a wheelchair for their entire lives.

Currently, there are no cures or even drugs that slow the pace of muscle weakness in these children. Our scientists are tackling this problem by investigating the function of the muscle genes and proteins present in myopathies and by developing novel animal models of childhood muscle disease. We are working on new treatments and, we hope, new lives for these children.

NEW WEB WONDER

We have a newly revamped Web site, where you can learn all about our latest research, community outreach, clinical trials, and more. Come visit us:

www.pnrd.umich.edu

THE RESEARCH PROGRAM WITH A DIFFERENCE

More than 30 researchers from many fields have come together to form the Program for Neurology Research & Discovery, with a single goal: discovering why diseases cause nerve and muscle cells to weaken and die, and what can be done to prevent or reverse that damage.

Under the direction of Eva L. Feldman, M.D., Ph.D., our team has undertaken research in some of the most complex and challenging fields of disease. From ALS to the nerve damage that disables people with diabetes, we are making medical discoveries that are bringing treatments to patients.

What makes this team of dedicated scientists so unique?

Cooperation, Not Competition: We are truly a collaborative effort, without the pressure to compete for individual funding or prestige. And that means more time and energy for research, not paperwork and politics.

The Perfect Environment: We are part of the U-M Health System, which offers researchers incredible research tools and resources. Our scientists can conduct their work faster and less expensively.

The Power to Turn Science into Practice: Our researchers are leading the way in translating laboratory discoveries into new patient therapies. Already, two discoveries have made the leap from the lab to clinical trails in people with ALS and Type 1 diabetes.

The Program for Neurology Research & Discovery: Scientists from many fields working together to create breakthroughs in the fight against disease.



BEYOND THE LABORATORY

None of our progress would have been possible without the thousands of people who donate their time, money, and hard work to support the Program for Neurology Research & Discovery.

A Run for the Research Money

On Sept. 28, the Big House Big Heart event drew 7,000 runners and walkers to the U-M stadium, where they got to watch themselves cross the 50-yard-line on the Jumbotron. Nearly \$250,000 was raised for charity. Two great U-M causes were the primary recipients: the Program for Neurology Research & Discovery (which received more than \$60,000) and the C. S. Mott Children's Hospital.

The man with the biggest heart is local attorney Mike Highfield, who started the run in 2007 after watching Phil Bowen, his friend and law partner, pass away from ALS. He and sponsor, Running Fit, have made this an instant fall tradition. For more information, go to www.bighousebigheart.com.



Dr. Eva Feldman at the Big House Big Heart run with the sons of Phil Bowen: Peter (left) and Matthew.



Dr. Bob Schoeni (right) talks to one of the volunteers at the A2A3 Family Field Day.

A Community Fights Back

When Dr. Bob Schoeni was diagnosed with ALS this summer, it was a shock to friends, colleagues, and family in the Ann Arbor community. A popular U-M professor, Bob has touched a lot of lives, especially through his coaching of girls' sports. A large number of Ann Arbor girls call him simply, "Coach Bob."

When his friends and coworkers heard about his condition, they organized a non-profit, A2A3 (Ann Arbor Active Against ALS), to support ALS research. Some of their initiatives include Training for a Cure, Coaching for a Cure, and Kids Active for a Cure. They have held a garage sale and Family Field Day.

A portion of the proceeds will go to ALS research at the Program for Neurology Research & Discovery. For information, go to www.a2a3.org.

Charity Event Par Excellence

For the past seven years, the Executive Women's Golf Association of Metro Detroit has conducted an end-of-season tournament to raise money for the Program for Neurology Research & Discovery. This year nearly 60 people teed off on September 25 at Twin Lakes Golf Club in Oakland Township. The golfers, sponsors, and a silent auction raised \$2,400.



Dr. Feldman with the co-hosts of the luncheon: (from left) Pamela Applebaum, Susu Sosnick, and Leslie Lewiston Etterbeek.

Stem Cells and Salads

Along with co-hosts Susu Sosnick and Pamela Applebaum, Leslie Lewiston Etterbeek invited Dr. Feldman to her Bloomfield Hills home to talk to 45 guests on Oct. 3 about stem cell research and the promise it holds for finding new treatments and cures for neurological disease.

Feldman explained what makes embryonic stem cells so special and the work she hoped to do at U-M if the research became legal in the state. Just one month later, the voters of Michigan passed a new law lifting the ban on stem cell research.

Executive Officers of the University of Michigan Health System: Robert P. Kelch, Executive Vice President for Medical Affairs; James O. Woolliscroft, Dean, U-M Medical School; Douglas Strong, Chief Executive Officer, U-M Hospitals and Health Centers; Kathleen Potempa, Dean, School of Nursing

The Regents of the University of Michigan: Julia Donovan Darlow, Ann Arbor; Laurence B. Deitch, Bingham Farms; Denise Ilitch, Bingham Farms; Olivia P. Maynard, Goodrich; Andrea Fischer Newman, Ann Arbor; Andrew C. Richner, Grosse Pointe Park; S. Martin Taylor, Grosse Pointe Farms; Katherine E. White, Ann Arbor; Mary Sue Coleman, ex officio

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NOW, YOU CAN MAKE A DIFFERENCE, TOO!

We want to speed the pace of medical discovery and the elimination of disease and suffering. If you can open up your heart and your checkbook, we promise to put your gift to work immediately.

One hundred percent of all donations go into research, not administrative costs. Because of our strong government and foundation grant support, the Program for Neurology Research & Discovery's operating costs are covered.

Your gift will go entirely to support research—which gives our team more freedom to explore new ideas quickly and pursue promising avenues to the fullest.

For more information on how to give, please call Stephanie Peterson at **734-647-0616**.

Visit the Program for Neurology Research & Discovery on the Web at www.pnr.umich.edu