

RESEARCH INTO MORE EFFECTIVE COCHLEAR IMPLANTS



Feinstein Institute for Medical Research/TNS

Loren Rieth, right, in his laboratory with research associates Tristan Liu, left, and Jason Wong. Rieth is part of an international team that will develop a new form of implant to dramatically improve hearing for the deaf.

LISTEN UP

Researchers hope to place an implant in the patient's auditory nerve, with a goal of producing a more natural form of hearing than with cochlear implants

By Delthia Ricks
Newsday

Since the 1980s, the cochlear implant has helped bring hearing to hundreds of thousands of people, but a new international effort aims to develop a new type of implant that will produce a keener, more natural form of hearing.

Scientists at the Feinstein Institute for Medical Research in Manhasset, fueled by a \$9.7 million federal grant, are part of a global initiative that involves physicians, surgeons, engineers and neuroscientists. They will develop not only a device but a form of surgery to place the implant in the auditory nerve, which communicates directly with the brain.

"I will be helping to develop the electrode arrays," said Loren Rieth, a professor at the Feinstein and a leading researcher in the field of bioelectronic medicine, which will be key in developing a new form of implant to facilitate hearing.

"We want to develop an electrode that goes directly into the auditory nerve. And we therefore hope to stimulate a smaller population of nerve fibers to produce a more natural form of hearing," Rieth said.

The grant is from the National Institutes of Health's Brain Research through Advancing Innovative Neurotechnologies, an initiative

"We... hope to stimulate a smaller population of nerve fibers to produce a more natural form of hearing"

— Loren Rieth, professor at the Feinstein Institute for Medical Research and part of an effort to create a new type of cochlear implant

that goes by the acronym BRAIN.

The grant will allow Rieth and his collaborators to develop the device and surgical approach, study the device's safety and effectiveness and ultimately implant the devices in volunteers with hearing loss who are not able to use cochlear implants.

Since the mid-1980s, the cochlear implant has been used to treat deafness via an electrode array that is placed in a bony spiral — a snail-shaped bone — in the ear, called the cochlea, to stimulate the auditory nerve. And while the implant has revolutionized sound perception for people worldwide, it does not provide hearing at lower frequencies, Rieth said.

The National Institute on Deafness and Other Communication Disorders estimates a growing need for hearing assistance, especially among people who are profoundly deaf. The institute estimates more than 324,200 people worldwide have cochlear im-

plants; about 96,000 of them are in the United States, including an estimated 38,000 children.

The device under development will be what Rieth calls "a quantum leap" over the cochlear implant because of its capacity to communicate directly with the brain.

In recent years, the Feinstein Institute has been studying and developing numerous bioelectronic implants to effectively treat a range of medical conditions, most resulting from inflammatory processes, such as lupus and rheumatoid arthritis.

Researchers, led by bioelectronic medicine pioneer Dr. Kevin Tracey, the Feinstein's president and chief executive, have worked on numerous other developments in the field as well, including a device that controls postpartum hemorrhaging.

Rieth, who came to the Feinstein Institute two years ago from the University of Utah, worked on the electronic architecture of the Utah Electrode Array, an infinitesimal implant — a brain-computer — that can send and receive brain impulses. Research projects

involving the Utah Array have focused on pain modulation and a bionic eye.

Now, Rieth and his Feinstein team, who are collaborating with an international group of scientists, hope to produce a tiny device within five years that will achieve sound resolution that covers a wide range of frequencies.

"I'm excited by the opportunity to apply the nerve stimulation approaches of bioelectronic medicine to hearing restoration, focusing on the hearing nerve that travels from the cochlea to the brain," Rieth said.

The research effort is being led by scientists at the University of Minnesota and will include those from six other institutions, including the University of Utah and Hannover Medical School in Hannover, Germany. Clinical testing on volunteers initially will be performed in Germany, Rieth said.

"The study brings together eight institutions from the United States and Europe to advance new devices for hearing loss," said Tracey, who also noted that collaboration across fields of expertise and institutions is critical to the success of bioelectronic medicine.

Testicular cancer can be treated effectively if diagnosed early

By Armin Brott
Tribune News Service

Dear Mr. Dad: I'm a single mother and my teenage son rather sheepishly told me that he thinks there's something wrong "down there." When I asked what he meant, he said something doesn't feel right. He's not the kind of kid who complains about his health very much, so I took him to his pediatrician who referred us to a urologist to do some tests to determine whether my son has testicular cancer! My son and I are really scared. What can we do?

A: Well, the first thing to do is thank your lucky stars that your son opened up to you — his mom — about what he felt "down there." Although testicular cancer accounts for only about 1 percent of all male cancers, it's the most common form of cancer among boys and men between 15 and 35 years old. This year, in the U.S. alone, more than 9,000 males will be diagnosed with testicular cancer, according to the American Cancer Society, and about 400 will die.

That leads me to the second thing you can do: Stay on top of the situation with the urologist. He (or she) will probably start with an ultrasound to find evidence of tumors. If one is found, the next step will probably be blood tests. But as scary as all this is, the good news is that testicular cancer, if caught early, has a 99% five-year survival rate.

Unfortunately, in general, men and boys are far less likely than women and girls to have regular contact with a healthcare provider. That makes early diagnosis of testicular cancer — and most other potentially serious health conditions — extremely difficult. As a result, too many cancers aren't diagnosed until it's too late, which helps explain why cancer mortality rates for men are notably higher than for women.

The third thing you and your son can do is help spread the word about testicular cancer. The most effective way to reduce the number of deaths from testicular cancer is to educate boys and young men (and those who love them) about the importance of doing regular testicular self-exams and recognizing the symptoms of the disease.

April is Testicular Cancer Awareness Month, so there couldn't be a better time to help men and boys learn about the importance of screenings and awareness for testicular cancer.

Men's Health Network (<http://menshealthnetwork.org/>), a national nonprofit advocating for the health and wellness of men and boys (full disclosure: I've been working with MHN for more than 20 years), encourages all young men ages 15-35 to regularly perform testicular self-exams, and if they feel a lump, a bump, or something that just seems "wrong," to tell someone — just like your son did — and to see a doctor immediately.

Treatment options for testicular cancer vary based on the stage, but can include surgery to remove the cancer, chemotherapy, and radiation treatment or some combination of the three. While increased awareness can help boys and men understand how getting treated for testicular cancer might affect their quality of life, it's important to note that having had testicular cancer won't necessarily affect their long-term ability to become fathers. In fact, recent studies have suggested that sperm counts for men who undergo chemotherapy or radiation eventually rebound to pre-treatment levels.

So with Testicular Cancer Awareness Month well underway, Men's Health Network invites and encourages all men to take their health into their own hands. Literally. And if you're in a relationship, you and your partner can examine each other (women should be doing monthly breast exams). If you or your partner finds something that doesn't feel right, pick up the phone and make an appointment with a healthcare provider. For more information and resources about testicular cancer and other male-specific health issues, visit <http://www.testicularcancerawarenessmonth.com/> and <http://www.menshealthresourcecenter.com/>

Read Armin Brott's blog at www.DadSoup.com, follow him on Twitter, @mrdad, or send email to armin@mrdad.com.

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Spring Cleaning 101

What you should know about the disposal of household hazardous waste.

What is household hazardous waste?
HHW is anything labeled toxic, flammable, corrosive, reactive or explosive. These materials can threaten family health and the safety of pets and wildlife.

What are some examples of household hazardous waste?
Aerosols, Bleach, Drain Cleaners, Metal Polish, Mothballs, Oven Cleaners, Toilet Bowl Cleaners, Ammonia-based Cleaners, Mercury Thermometers, Wood Polishes, Waxes, Fertilizers, Insecticides, Herbicides, Rodenticides, Spa and Pool Chemicals, Roofing Compounds, Antifreeze, Batteries, Motor Oil, Paint Strippers and Thinners, Gasoline and more.

Where can I safely dispose of my hazardous waste?

La Grande Facility: Open to any resident of the three counties every other Tuesday, 8am-12 noon. By appointment, however, small labeled quantities accepted daily. (541) 963-5459.

Baker City Facility: Open the first Wednesday of each month, 10am-12 noon. By appointment only. (541) 523-2626.

Enterprise Facility: Open the 1st and 3rd Wednesday of each month 10am-12 noon. By appointment only. (541) 426-3332.

Americans generate 1.6 million tons of HHW per year!

The average home can accumulate as much as 100 pounds of hazardous waste.