

News

- Biomedical Engineering
- Civil, Architectural and Environmental Engineering

- Electrical and Computer Engineering

RECENT POSTS
Mechanical and Aerospace Engineering
Internship Profile: Jason Blume, Mechanical Engineering '19 (Altec Industries)

Internship Profile: Rachel Deradoorian, Architectural Engineering '19 (Bedrock Detroit)

Engineering Associate Professor and the City of Coral Gables Selected Finalists in U.S. Mayors Challenge

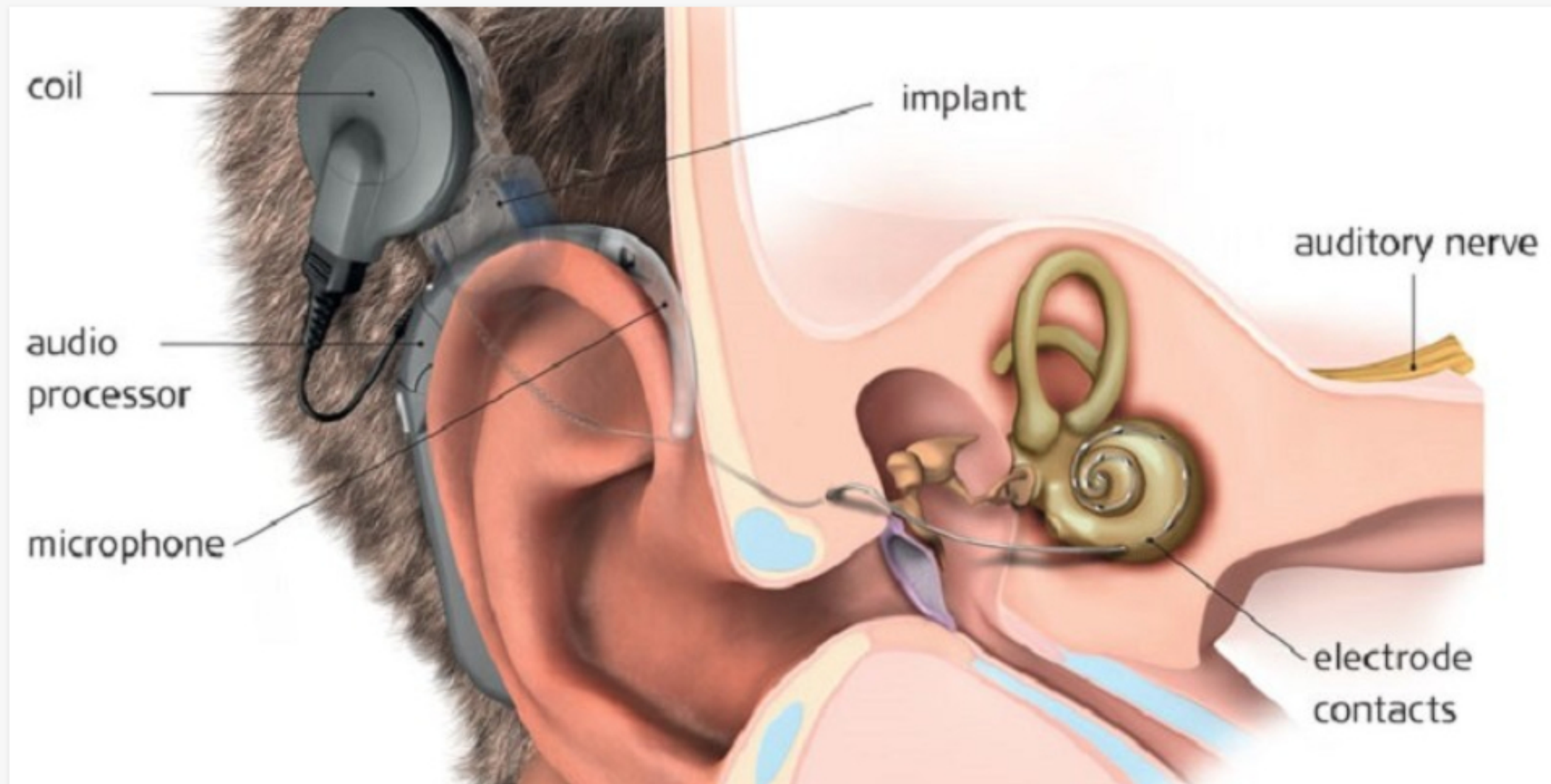
The American Council of Engineering Companies of Florida Honors the University of Miami with Two Awards for Innovation Bridge

Alumnus Profile: Juan Pablo Ruiz, BSBE '13

CATEGORIES

- '92
- 1940s
- 1950s
- 1960s
- 1970s
- 1980s
- 1990s
- 2000s
- 2010s
- 70 for 70
- Alumni
- Alumni Stories
- Biomedical
- Civil, Architectural, Environmental
- COE
- Electrical and Computer
- Giving Stories
- Graduation Story
- Industrial
- J and J Lab
- Mechanical and Aerospace
- Research
- Senior Design
- Students

[Home](#) / [Biomedical - COE - Research](#) / [Conserving Hearing During Inner-Ear Surgery](#)



Biomedical, COE, Research

Conserving Hearing During Inner-Ear Surgery

An NIH grant is helping a College of Engineering faculty member study the use of mild hypothermia during cochlear implant surgery

A \$450,000 grant from the National Institutes of Health (NIH) is helping Suhrud M. Rajguru, an assistant professor in the College of Engineering's Biomedical Engineering Department and Miller School of Medicine's Department of Otolaryngology, explore how hypothermia might help preserve residual hearing in patients who undergo cochlear implant surgery.

Cochlear implants have allowed hundreds of thousands of people with deafness to hear. But the insertion of these devices is traumatic for the inner ear and can cause damage, including loss of any residual hearing a patient may have. That residual hearing can be utilized by a new generation of implants, which improves the patient's ability to understand speech. Preserving residual hearing may also allow patients to benefit from future technologies or therapies.

Using the grant, which is from the NIH's National Institute on Deafness and Other Communication Disorders, Rajguru is developing and testing applications of localized, mild hypothermia. Using a custom-designed thermoelectric cooling device, his method reduces the temperature of the cochlea by between four and six degrees, before and during cochlear implant surgery. Therapeutic hypothermia has long been known to help protect nerves after traumatic injuries or injuries that restrict blood flow to an area. Rajguru and his team's research, which was published recently in the journal *Hearing Research*, has shown that it can also provide significant protection from functional hearing loss caused by trauma when a cochlear implant is inserted.

"We know that mild to moderate, localized hypothermia can protect the neural structures in the cochlea and prevent the loss of residual hearing after these implantations," Rajguru says. "But we don't understand the molecular mechanisms of how it does so." Research indicates that hypothermia regulates the cascade of signals that cause inflammation when an implant's electrodes are inserted. Rajguru wants to determine exactly which "inflammatory signaling events" hypothermia regulates and how they are altered. "This will extend the utility of hypothermia in surgeries involving the inner ear," he adds.

Fred F. Telischi, MD, professor and James R. Chandler chair of otolaryngology at the Miller School of Medicine, stresses the importance of using hypothermia in surgeries involving cochlear implants: "Helping to ensure that the neural structures in the cochlea are left undamaged is critical in enabling patients undergoing cochlear implant surgery to benefit from future therapies and technologies."

Ultimately, mild hypothermia may be combined with drugs that protect the nerves of the ear during surgery. "This combination may lead to novel ways of preserving sensitive auditory and vestibular function during all inner-ear surgeries," Rajguru says. "Our two major objectives are to identify the inflammatory signaling events regulated by mild hypothermia during cochlear implantation, and to develop a clinical device that will better maintain residual hearing afterwards."

Jan 30

[← Methane as a Fuel Source](#)

[→ Public Health House Calls Address Critical Needs](#)



COLLEGE OF ENGINEERING

1251 Memorial Drive
McArthur Engineering Building
Coral Gables, FL 33146
(305) 284-2404

CoE NETWORK

- [ABOUT COE](#)
- [COE NEWS](#)
- [COE EVENTS](#)
- [APPLY](#)
- [ALUMNI ASSOCIATION](#)

RESOURCES

- [CANE LINK](#)
- [GRADESFIRST](#)
- [MYUM](#)
- [SITEMAP](#)
- [VIACOMP](#)