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USC researcher Mark Humayun wins 2005 R&D Innovator of the Year Award

R&D Magazine has chosen University of Southern California ophthalmologist Mark Humayun to receive its 2005 Innovator of the Year Award for his work in creating an implantable artificial retina that promises to restore sight to blind patients.

Humayun, M.D., Ph.D., is a professor of ophthalmology in the Keck School of Medicine and of and biomedical engineering in the Viterbi School of Engineering of USC, and the associate director of research at the Doheny Eye Institute at USC. He will receive the award in Chicago at *R&D Magazine's* Annual R&D 100 Awards Banquet on Oct. 20.

"I am honored and delighted to be selected for such a prestigious award," says Humayun. "I would like to recognize the effort of our entire team working on the retinal prosthesis, which has enabled me to be chosen for this award."

Humayun will be the fifth "Innovator of the Year" the magazine has named. Previous winners include: Burt Rutan, developer of SpaceShipOne, the first private vehicle to enter space; Ian Foster, a computer scientist at Argonne National Laboratory who helped develop shared computing over the Internet; Larry Page, co-founder of Google; and Stuart Parkin, an IBM researcher who developed a device now used in almost every hard-disk drive.

"We have been aware of Professor Humayun's work for some time," says Tim Studt, editor in chief of *R&D Magazine*. Humayun was selected for the award by the magazine's staff and a panel of judges, who were impressed with the retinal prosthesis' technological significance.

Humayun, a surgeon who also holds a Ph.D. in biomedical engineering, began working on the retinal implant 17 years ago with Eugene De Juan, who is now Professor of Ophthalmology of the Doheny Retina Institute at USC. Along with research partners Second Sight, Inc., Department of Energy laboratories, and engineers from USC, the California Institute of Technology, the University of California at Santa Cruz, and Northern California State University, they developed a device that can stimulate the remaining undamaged cells in the eyes of people suffering from retinitis pigmentosa, a degenerative retinal disease. There is no treatment for the disease, which causes blindness as the rods and cones in the eye lose their ability to function.

The first retinal implant device consisted of a grid of 16 electrodes that were implanted in subjects' eyes, and fed data from an external camera mounted on eyeglasses. The first test subjects have been able to distinguish between shapes and light areas from and dark areas.

This winter, Humayun plans to start tests with an upgraded version of the retinal grid with 60 electrodes that he believes will allow for better visual resolution in subjects.

“Large interdisciplinary research projects such as the development of the retinal prosthesis necessitate the blending of engineering, medicine, and biology, and are not only sustained through fostering common interests, but also through long-term funding,” Humayun says. The retinal implant project has received funding from the Department of Energy, the National Science Foundation and the National Eye Institute.

Department of Energy researchers at Lawrence Livermore, Los Alamos, Sandia, Oak Ridge, Argonne and Brookhaven National Laboratories have also contributed to the project.

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