

## New surgery and headset may boost vision

A surgical technique may one day benefit people suffering from a blinding eye disease known as macular degeneration, according to a preliminary study of monkeys. If that approach doesn't work, another might: Researchers are working on a futuristic headset that would help people with impaired vision see the world on a personal television-like monitor.

Henry J. Kaplan and his colleagues at the Washington University School of Medicine in St. Louis wanted to find a way to correct age-related macular degeneration. In the so-called wet form of this disease, an abnormal growth of leaky blood vessels leads to injury of the macula — the center of the retina that distinguishes details. This process, which usually strikes older people, gradually causes blurring of central vision and, in severe cases, blindness.

Kaplan's team began by operating on three healthy macaque monkeys. First, the surgeons made an incision in the retina. Then they used a pair of small, tweezer-like instruments to remove retinal pigment epithelial cells, the part of the macula damaged by scar tissue.

One hour after surgery, they sacrificed and examined one of the monkeys. As expected, they found a bare spot where they had removed part of the retina. However, three weeks later, they found the beginnings of a repair process in a second monkey. Nine months later, examination of the third monkey revealed new retinal pigment epithelial growth in areas that had been stripped during the operation. In addition, photoreceptor cells that had been disrupted by surgery had healed, suggesting that the blurry vision caused by the surgery had improved. Kaplan described the new findings last week at the annual meeting of the Association for Research in Vision and Ophthalmology, held in Sarasota, Fla.

While the surgeons couldn't test the monkey's vision, they did make another surprising observation at about the same time. An 80-year-old woman with macular degeneration, who had received a similar experimental operation at Washington University, came in for a checkup. Just before surgery, she had 20/400 vision, which made her legally blind in one eye. To make sure her vision didn't get any worse, Kaplan's group removed the scar-damaged retinal pigment epithelial cells. About a year later, her vision had improved to 20/60.

Kaplan believes the same repair process observed in the monkeys helped the woman see better, although he admits that further studies with a large number of human patients are needed to test this theory. Lee Jampol, a retinal expert at Northwestern University Medical School in Chicago, warns against jumping to conclusions based on a very preliminary

monkey study. "So far, this is not a wonder procedure," Jampol says. "It's not going to mean the end of macular degeneration," he adds, noting that other researchers have tried a similar technique on human patients, with disappointing results so far.

Surgery isn't the only approach. This week, scientists at NASA and the Wilmer Eye Institute of Johns Hopkins University in Baltimore unveiled a prototype device that may one day help people suffering from macular degeneration or other eye disorders. More than 80 percent of people who are legally blind retain some vision and would be candidates for the new device, the researchers note.

Using computer technology developed by NASA for processing satellite images, the scientists designed a device that looks like a wraparound headset. A tiny camera mounted on the device records the scene in front of the wearer and

displays it on two video screens, says Robert W. Massof, director of the Wilmer Eye Institute. By turning a knob on the headset, the wearer can adjust the contrast of the video image or magnify it.

"A large part of the consumer market for this will be senior citizens," Massof says. "The number of senior citizens is growing, and many of them will develop vision problems that this device will solve."

While the new headset is expected to be available within the next 18 months, a more ambitious device is expected to remain in the laboratory for a few more years. In that version, the headset is connected to a computer that corrects for the patient's visual defect and then displays the corrected image on the video screens, says Doug Rickman, low-vision project manager at NASA's Stennis Space Center in Mississippi. Rickman has tested such a device in the laboratory, but since it relies on a massive supercomputer, a portable version may take five years to develop, he says. — K.A. Fackelmann

## Climate treaty avoids strict CO<sub>2</sub> limits

To the dismay of environmentalists and several industrial nations, the United States defeated attempts to set international limits on emissions of greenhouse gases. In the final negotiations on a climate treaty, representatives from 150 nations last week agreed on a compromise text that will lead countries to reduce emissions of gases threatening to warm the world. But the text does not require any specific reductions.

The accord will next travel to Rio de Janeiro for signature by world leaders in June during the United Nations Conference on Environment and Development. The new agreement, the Framework Convention on Climate Change, is the first major international treaty to address the global-warming threat. It sets the course for future negotiations on specific actions to limit climate change.

Almost all wealthy industrialized nations aside from the United States had hoped the convention would commit developed countries to stabilizing their carbon dioxide emissions at 1990 levels by the century's end. Many countries have already announced national commitments to stabilize or reduce emissions. But the Bush administration has steadfastly opposed efforts to set limits, citing economic uncertainty about the cost of reaching such targets.

In the end, the U.S. position won. Written in ambiguous, convoluted language, the convention commits developed countries in a nonspecific way to adopt national policies that limit emissions and enhance "sinks" and "res-

ervoirs" that absorb and store greenhouse gases. The next sentence, which runs 118 words, recognizes that "the return by the end of the present decade to earlier levels of anthropogenic emissions of carbon dioxide and other greenhouse gases" would be consistent with the goal of limiting emissions.

The following paragraph commits countries that accept the convention to provide detailed information, periodically, on their policies to reduce emissions, "with the aim of returning individually or jointly to their 1990 levels." This paragraph mentions no timetable for reaching such levels.

David Doniger, with the Natural Resources Defense Council in Washington, D.C., criticized the U.S. opposition to a stronger treaty. "The U.S. behavior in this process is especially bizarre since the United States by virtually all decent analyses has the opportunity to meet the stabilization objective for free or for profit," he says.

Cornelia Quennet, Germany's main negotiator, told SCIENCE NEWS, "We are not happy that we could not reach one of our aims, which was stabilization." But she praised the agreement as a compromise that "made it possible for a broad group of countries to sign." That is important, she says, because such nations must develop and implement programs that will reduce greenhouse gas emissions.

Quennet also notes that the convention sets a firm process for continuing negotiations starting this year, thus avoiding a wait of several years while countries ratify it. — R. Monastersky