Extracts

Surgeons Report High-Tech Spectacles Ease Strain

Patients going under the knife aren't the only ones who end up with their share of aches and pains after an operation. Many physicians grapple with substantial neck and back strain by the end of a grueling day in the surgical suite.

Now University of Florida researchers say a pair of lightweight, high-tech glasses could be the prescription for relief. They put the eyewear to the test and found it helped prevent much of the discomfort surgeons experience after performing minimally invasive procedures. These operations usually require surgeons to peer at a small video monitor placed at an awkward angle up to 10 feet away.

Dr. Scott Schell demonstrates eyeglasses he developed that project the view from microsurgical equipment directly in front of the eyes so a doctor does not have to twist in an unnatural and tiring position to watch a monitor.

The high-resolution glasses project a 52-inch stereoscopic image about six feet into space, enabling doctors to view the operative field no matter where they turn their heads.

"Minimally invasive or laparoscopic surgery has really been a dramatic and revolutionary improvement in the performance of certain procedures, not only for the safety and comfort of patients but also for cost and outcome," said Dr. Scott Schell, an assistant professor of surgery and of molecular genetics and microbiology at UF's College of Medicine. "But, in contrast to standard operating procedure where surgeons stand and look down at their hands while operating, during minimally invasive surgery the hands may be pointed in a completely different orientation than where the eyes are looking because the surgeons are not looking at a wound, they're looking at a screen. So in lengthy procedures, that practice increases the possibility they could develop neck and back strain because they're not in a comfortable position."

During minimally invasive procedures, surgeons make tiny incisions — some as small as an eighth of an inch — and thread a fiber-optic camera through a catheter to see inside the body. The operation is performed using surgical instruments inserted through the incisions. Depending on the operation, minimally invasive procedures can last anywhere from 30 minutes to eight hours.

Surgeons wearing the video-projection glasses can look down at their hands while operating — a more natural and comfortable orientation, Schell said. The eyewear resembles a large pair of sunglasses and weighs about 3.5 ounces.

"The glasses provide a picture of what you'd see inside the abdomen if you opened up the abdomen," Schell said.

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Gene Therapy Could Protect Heart During Attacks

A team of University of Florida researchers has used gene therapy to develop a tiny biological machine that could one day be injected into heart attack-prone patients to recognize and stop new heart attacks.

The UF team used a harmless virus to deliver a combination of genes to animal heart tissue that protected the tissue from heart attacks, according to an article in *Hypertension*, a journal of the American Heart Association. The virus sensed when the heart tissue began to experience hypoxia, or oxygen deprivation, and switched on the protective genes, which prevented the damage and

Plastic Film Being Tested To Regulate Plant Growth

To help commercial nurseries keep plants uniform in size, University of Florida researchers are testing colored plastic films that filter out growth- promoting light waves.

Sandra Wilson, an assistant professor of environmental horticulture with UF's Institute of Food and Agricultural Sciences, said the photo-selective plastic film in her current experiment filters out far-red light, which is responsible for stem elongation in plants.

"When grown in a greenhouse covered with photo-selective film, plants respond to subtle changes in the amount of far-red light they receive," Wilson said. "The goal is to inhibit stem elongation without sacrificing plant quality."

The horticulture industry prefers uniform plant size because it speeds plant establishment in the field and makes it easier to pack and ship mature plants. Traditionally, chemicals have been used to control plant height but, because of increasing environmental

Eric Zamora

scarring, called ischemia, that usually results.

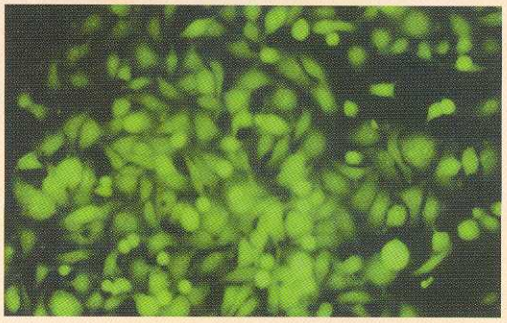
It may take years, but UF researchers say the technique of using such "vigilant vectors" to transmit gene switches could be translated into treatments for a host of other disorders as well, such as diabetes and stroke.

"The concept is that we give an IV injection, and although the vector goes everywhere in the body, it only works in the heart or other targeted organ or tissue," said Ian Phillips, the study's principal investigator and a professor and chairman emeritus of the UF College of Medicine's Department of Physiology. "It just waits there until the right moment arrives to help the person."

The UF team used the adeno-associated virus, a commonly used gene carrier, to insert the cardio-protective gene switch. The apparently harmless virus, known as AAV, has unusual properties that make it ideal for transporting corrective genes into human cells, including that it carries no DNA of its own, Phillips said.

The UF team spent two years developing the heart-attack-preventing gene "switch" using a combination of genes from human and yeast cells, Phillips said.

Active only in heart tissue, the switch "turns on" the protective genes during the four- to six-hour window when hypoxia is known to lead to ischemia. This defends the heart cells in the low-oxygen condition and subsequently prevents damage to the heart tissue, Phillips said. When the hypoxia goes away, the switch turns off again.



Adeno-associated virus (AAV)

The research has so far proved successful in animal tissue cultures and on a limited basis in experiments with live rats, but Phillips said developing experiments and treatment for people is still many years away.

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Sandra Wilson, assistant professor of environmental horticulture, examines a wine sage plant grown in a greenhouse covered in photo-selective polyethylene film. The new film, which filters out far-red light waves, is used to keep plants compact to ease shipping problems.

concerns, researchers are seeking other methods to control plant height.

Wilson has been testing the new film on subtropical annuals and perennials at UF's Indian River Research and Education Center in Fort Pierce, where she has obtained favorable results.

"Most plants grown under the far-red light-absorbing film are about 25 percent shorter than plants grown under clear film, which is used as a control standard to compare effects of the colored film," Wilson said. "The results are comparable to plants treated with chemical growth regulators."

Japan-based Mitsui Chemicals contracted with UF and several other institutions to test the green film in various regions of the United States. Ohio State University and Clemson are testing plants from their regions, and UF is testing Southern plants.

"Because of Florida's warm climate, we can grow subtropical plants," Wilson said. "This was a good trial because many of the species we worked with in Fort Pierce were traditionally 'leggy,' meaning they grow fast and are extremely elongated. The good results with these plants bode well for other species."

Wilson said UF is also testing the polyethylene film to determine if it degrades faster in hot regions.

"One of the problems we've encountered has been a short film life," Wilson said. "The dyes start to degrade after one year, so research is being conducted to increase the stability of the dyes."

In addition to ornamental plants, the colored films have been used on food plants such as bell peppers, tomatoes and watermelons.

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Spring 2002, Vol. 7, No. 1

Explore

Research at the **University of Florida**

Explore: Research at the University of Florida is published by the Office of Research & Graduate Programs at the University of Florida. For more information about the research program, contact Vice President for Research Win Phillips, D.Sc., 223 Grinter Hall, Box 115500, Gainesville, FL 32611-5500 (Phone: 352/392-1582). For details about research highlighted in this issue, contact the editor or the researchers directly.

The publication of *Explore* is not financed by state-appropriated funds. Opinions expressed do not reflect the official views of the university. Use of trade names implies no endorsement by the University of Florida.

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Printing:
StorterChilds Printing, Gainesville

Member of the University Research Magazine Association
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