

From the Director

Dear Friends,

The Michigan Difference is the theme of the University of Michigan development campaign, and the theme of a talk I recently gave as part of the Dean's Lecture Series at the UM Medical School. We make a decided difference in our patients' lives by bringing research advances directly to them.

To cite just one example in this issue, we have a new state-of-the-art diagnostic tool that allows us to pinpoint diseases of the retina at an exceptionally early stage. That information will bring earlier care to patients with diseases such as retinitis pigmentosa, and it will generate data for our researchers who seek cures for inherited retinal diseases.

A great deal of our research involves the genetics of eye disease. It is a complex subject, even for scientists. Now one of our researchers, Dr. Julia Richards, has written a book for those who are *not* scientists or physicians. It is a "user's guide" that explains very clearly what everyone needs to know about genetics and the rapidly evolving field of genetic therapies. I know you will find this book to be useful. I did.



Paul R. Lichter, M.D.
Director, University of Michigan
W.K. Kellogg Eye Center



photo by Lin Goings

Dr. Moroi examines a patient who could benefit from a new surgical technique.

Putting the brakes on healing

Scientists at the Kellogg Eye Center have developed a new surgical approach that may improve the success of one of the most common surgeries for glaucoma. The unique properties of amniotic membrane could help assure that the drainage channel created during trabeculectomy remains open rather than healing itself shut.

Today many patients with glaucoma must undergo repeat surgeries to create new filtration channels, says Sayoko E. Moroi, M.D., Ph.D., a Kellogg ophthalmologist and glaucoma researcher. "Some of our patients have undergone repeat glaucoma filtration surgeries over the course of many

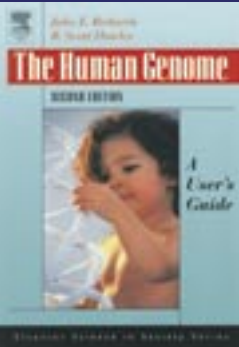
years," she says. "Many of the high-risk patients are likely to benefit from this new procedure." Patients who are African American, Hispanic, young, or have previously failed filtration surgery, are considered to be at high risk for filtration failure.

Dr. Moroi has conducted preliminary studies, and now, under a University of Michigan Clinical Research Initiative Award, she will begin a randomized study in 40 patients. For half of them, she will insert amniotic membrane—the FDA approved its use in 2000—during surgery. Dr. Moroi and her colleagues hope the findings will provide the basis for a larger multi-center, federally-funded investigation.

Lowering eye pressure is at present the main treatment for glaucoma, an eye disease that can cause blindness if left untreated. The aim of the trabeculectomy is to create a drainage channel that diverts eye fluid as a means of keeping eye pressure at the proper level.

continued on page 3

A "User's Guide" for the Genetics Age



A research scientist who specializes in the genetics of glaucoma has written a book explaining why just about everyone needs to acquire a basic vocabulary in genetics. According to Julia E. Richards, Ph.D., "This book is meant for all of

those patients who want to know enough about their own genomes to be able to take advantage of advances in genetic medicine likely to emerge in this century."

Kellogg's Dr. Richards and co-author R. Scott Hawley, Ph.D., have written *The Human Genome: A User's Guide*. In user-friendly language, they lay out the basics of genetics, the tremendous advances in genetic research in recent years, and the very real and personal way that it affects human lives.

The book begins with the story of Brenda, a graduate student in Dr. Hawley's laboratory. In light of Brenda's struggle with leukemia, the authors discuss current research on therapies, such as "molecular lances," that will target leukemia and other cancer cells.

Other sections review how genes work and how they control the activity of the cell, concepts of heredity, how mutations arise, developments in cloning and genetic therapies, and discoveries of genes related to cystic fibrosis, glaucoma, and a host of lesser known conditions.

While describing the success of the Human Genome Project, the authors take a look at hard questions that arise from it, such as issues of genetic self-determination and how to deal with things we can test for but cannot treat.

When Dr. Richards started graduate school, finding part of a gene was cutting-edge science. Now genomic experiments evaluate tens of thousands of genes at once.

"We are at the beginning of something quite wonderful," she adds. "I trust that we will proceed with the right mix of hope and caution as we translate genetic advances into new gene-based medicines."



photo by Lin Gaings

Dr. Levin is part of a nationwide study to evaluate treatments for children with vision problems.

TAKING A LOOK AT CHILDREN'S EYE CARE

Best eye care for children is the goal of a nationwide effort that is comparing treatments offered to young patients with eye disease. Erika M. Levin, M.D., Kellogg pediatric ophthalmologist, will participate in a series of multi-center trials as part of the Pediatric Eye Disease Investigator Group (PEDIG).

Dr. Levin observes that many studies on children's eye diseases are limited by the relatively small number of patients with any given condition. Multi-center trials allow pediatric eye care specialists around the country to enroll patients into a single study. "If we can look at large numbers of children with similar eye diseases, we'll have a better idea of which treatments are most effective," she says. The study group includes academic centers like the University of Michigan, as well as smaller community centers.

One of the first studies at Kellogg will look at treatment for children with early-

onset esotropia, or crossed eyes. Dr. Levin and colleagues will follow the progress of children 6 months to 5 years old who may need glasses or surgery for this condition.

Two upcoming studies will evaluate care for children who have blocked tear ducts. The first will assess which surgical procedures are most successful as first-line treatment. A second study will compare alternative surgical treatments for children who have experienced a failed surgery.

Some of Dr. Levin's patients have already completed surveys that provide data for future investigations. She asked her patients to rate symptoms of nasolacrimal duct obstruction—tearing and discharge—and to comment on how it affected their quality of life. For example, a day care worker may send a child home because the condition looks like highly contagious pinkeye, when in fact, there is no danger of it spreading from one child to the next.

Earlier PEDIG studies on amblyopia (poor vision in one eye) drew considerable attention in the popular press and medical journals. "The coverage shows something we all know—that there is a great deal of concern about getting the best health care for our children," says Dr. Levin.

Pediatric ophthalmologists Steven Archer, M.D., Monte Del Monte, M.D., and Maya Eibschitz, M.D., will also enroll patients in select PEDIG studies.

To enroll a patient, please contact Jorie Jackson at joriej@umich.edu.

Having cataract surgery? New accommodating lens restores youthful vision

People who have cataract surgery may not have to worry about misplacing their reading glasses any longer, thanks to a new implantable lens that moves like the eye's natural lens. The new lens is designed to shift its position within the eye, allowing both near and far vision.

Everyone loses the natural elasticity of the lens with age. This creates a loss of accommodation, or ability to see at different distances without glasses. The condition is known as presbyopia and, as a result, most people need bifocals or reading glasses beginning around age 45.

Michael Smith-Wheelock, M.D., ophthalmologist at the University of Michigan Kellogg Eye Center, now offers an accommodating intraocular lens (IOL) to some individuals undergoing cataract surgery. It provides his patients with functional vision, or, as Dr. Smith-Wheelock says, "good walking around vision." While individuals may still need eyeglasses for extremely small print, for example in medicine inserts, most regain the ability to read a newspaper and see into the distance without glasses.

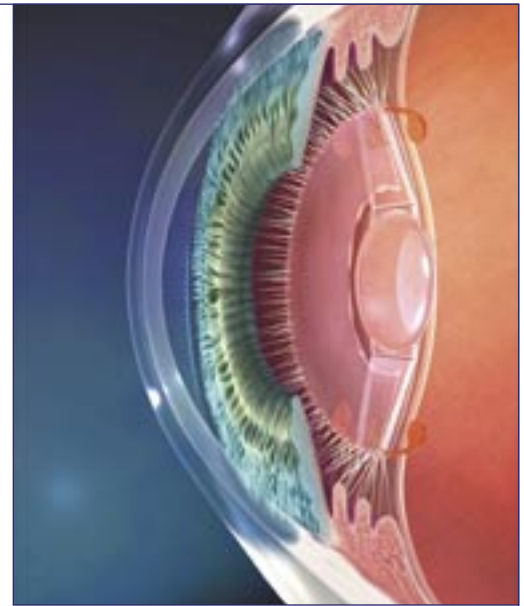
Robin Dudley, among the first to have the surgery at Kellogg, says the new lens has changed his outlook on life. An auto mechanic and teacher of the trade, he was beginning to experience double vision due to cataracts. "Imagine looking at a running engine and not knowing whether a sharp object is nearby," he said. "I thought about retiring, but now, why should I?" He jumped at the chance to try the new IOL because it would give him the range of vision he needed for his work.

The lens exceeded Mr. Dudley's hopes. He easily adapted to it, using eye drops for only a short period after surgery. "It's beyond great. I wish this had been available five years ago," he said.

"A clouding of the lens inside the eye, or cataract, will affect just about everyone sooner or later," says Dr. Smith-Wheelock. When visual quality is sufficiently impaired, cataract surgery is performed to remove the cloudy lens, replacing it with a fixed artificial clear lens.

The new lens, Crystalens™, includes hinges that work with the eye's focusing muscles so that the lens can move forward or backward as needed for near, intermediate, and distance vision. "The lens mimics the natural action of the eye, which has its own auto-focus function," explains Dr. Smith-Wheelock.

The lens device was approved by the FDA in 2003, but Medicare had placed



The accommodating lens is implanted like a standard IOL.

restrictions on its availability. In May of this year, Medicare changed its policy to allow its beneficiaries to select the new IOL. Those insured by Medicare and private insurance are required to cover costs that exceed that of a conventional lens.

Dr. Smith-Wheelock sees the new accommodating IOL as a terrific alternative for the right person. "Our patients say they come out of cataract surgery with the eyes of a 30-year-old. Their world is much more clear and in focus when they read, watch television, or drive down the highway. The future of this lens is very promising," he says.

healing

continued from page 1

The body's natural tendency to heal itself, however, is a threat to keeping that channel functioning as intended. Scars may form or the channel itself may close up in an attempt to "heal" the opening; either event can result in the build-up of fluid and increased eye pressure.

The concept of using amniotic membrane in glaucoma surgery occurred to Dr. Moroi after she learned of its success in cornea surgeries and surgeries of the front portion of the eye. The membrane, which is obtained from cesarean deliveries, has

been shown to reduce inflammation, to prevent the formation of new blood vessels, and to decrease scar formation.

These same properties, says Dr. Moroi, are desired to improve the success of glaucoma filtration surgeries. "If we can prove this to be the case," she says, "it could mean that patients at high risk for filtration failure will be making fewer trips to the operating room."

Support for the study also comes from the Midwest Eye-Bank and Transplantation Center.

Advances in Research

To learn more about the Kellogg Eye Center, contact the marketing staff at:
aboutkellogg@umich.edu
734.647.5586

The Regents of the University of Michigan:
David A. Brandon, Ann Arbor; Laurence B. Deitch, Bingham Farms; Olivia P. Maynard, Goodrich; Rebecca McGowan, Ann Arbor; Andrea Fischer Newman, Ann Arbor; Andrew C. Richner, Grosse Pointe Park; S. Martin Taylor, Grosse Pointe Farms; Katherine E. White, Ann Arbor; Mary Sue Coleman, ex officio



New technology helps detect hidden

EYE DISEASES

Ophthalmologists at the UM Kellogg Eye Center are using a new technology to detect their patients' hard-to-find retinal diseases. The Multifocal Electroretinogram, or mfERG, is a tool that can help diagnose retinal diseases that may be missed by a standard ERG.

While an ERG uses an electrode contact lens to measure the retina's response to light, the mfERG measures responses in the central 50 degrees of the retina only, thereby pinpointing small areas where retinal diseases can reside. This is important because the early stages of retinal diseases, such as retinitis pigmentosa, diabetic retinopathy and macular degeneration, start out in these small areas.

In preparation for the 10-minute test, patients will have an electrode contact lens placed on their affected eye(s). Once the lens is in place, they look into the telescope-like mfERG and focus on a small "X" in the center of a black and white honeycomb pattern.

While the patient focuses on this "X," the 103 hexagons that make up the honeycomb pattern flicker between black and white. This flicker stimulates the eye to react and these electrical reactions are then recorded by the contact lens and uploaded into the mfERG software. This software generates several different graphs and views that help ophthalmologists pinpoint the diseased areas of the retina.

The Kellogg Eye Center has been using the mfERG since August and

is one of only a handful of eye centers in Michigan to possess this new technology. In addition to using this tool to diagnose retinal diseases, it also can be used for clinical trials—to test how vision is affected by certain medications. If effectiveness can be measured early, ophthalmologists will know whether a certain treatment is working and should be continued. Patients will know that they have a promise of improvement.



photo by Lin Goings

Naheed Khan tests a patient for barely detectable signs of retinal disease.



In this issue, read about research advances in glaucoma surgery, children's eye care, a new IOL, and diagnostic testing.

Department of Ophthalmology and Visual Sciences

1000 Wall Street
Ann Arbor, MI 48105

NON-PROFIT ORGANIZATION
U.S. POSTAGE PAID
KELLOGG EYE CENTER
144