We aspire to be the leading eye center in the country—second to none.

We aspire to apply the latest in science to the treatment of blinding eye disease, while continuing to provide true excellence in patient care and training the next generation of leaders in scientific and clinical ophthalmology. In all of our missions, we aspire to be second to none.

With your support, the Duke University Eye Center will realize our soaring aspirations—to cure, to heal, to serve—and ultimately, to win the battle against blinding eye disease.
At the Duke University Eye Center, our ambition is to be second to none. Our basic science researchers and clinician-scientists collaborate daily to fulfill our three-fold mission: to pursue the most advanced research, to provide our patients with the very best care, and to train the next generation of scientific and clinical leaders in ophthalmology.

Together with our generous philanthropic partners, supporters, and ambassadors, we look forward with great anticipation to the opening of the Albert Eye Research Institute, and ultimately, to the opening of a new clinical pavilion. Inside these state-of-the-art facilities, researchers and clinicians will work together, translating scientific innovations into new treatments that will preserve and restore sight for generations to come.

At the Duke University Eye Center, we have soaring aspirations to cure, to heal, to serve. With your help, we are confident that we will achieve our ultimate goal: to win the battle against blinding eye disease.
For generations, the Duke Eye Center has helped preserve the gift of sight for children and adults throughout North Carolina and the Southeast. Renowned for innovations in microscopic and laser surgery, superb clinical care, and excellent training for tomorrow’s ophthalmologists, the Duke Eye Center today is poised to fully realize its potential as an international center for groundbreaking eye research.

As medical science enters a new era of discovery spawned by advances in molecular biology and genomics, the promise of new cures for devastating eye diseases is brighter than ever. I am proud to support the Eye Center’s vision for the future, beginning with construction of the Ruth and Herman Albert Eye Research Institute. This state-of-the-art facility will provide advanced laboratory equipment and space to accommodate additional faculty. But more importantly, it will facilitate the collaboration and synergy that occurs when clinicians and researchers work closely together.

In the following pages, you will learn about the extraordinary research now underway at the Duke Eye Center and the tremendous impact new treatments have had on our patients. You will also hear about the critical role our friends and donors play in supporting this important work. I encourage you to become involved, and I pledge our institution’s continued support for the Duke Eye Center.

Sincerely,

Ralph Snyderman, MD
Chancellor for Health Affairs
President and CEO, Duke University Health System
Researchers’ collaboration results in superior patient care

R. Sanders Williams, MD

By its very nature, ophthalmology has always been about looking deep—using magnification to explore the tiny and delicate structures within the eye that transform light into images, the miracle of sight.

With the advent of genetics and molecular science, ophthalmology researchers—like other medical scientists—are now able to see and manipulate the innermost workings of the cell. This new understanding holds great promise for predicting and preventing the diseases that continue to rob children and adults of precious eyesight.

As you will read, Duke Eye Center researchers are advancing against eye disease on all fronts. They are learning to manipulate genes to treat glaucoma, corneal disease, and diseases of the retina. After years of studying cellular processes within the structures of the eye, they are developing new surgical procedures to restore sight, such as corneal transplantation and macular translocation surgery.

Many projects now in the early stages at the Eye Center could scarcely have been imagined a decade ago: cell therapy to restore sight in retinitis pigmentosa, a gene “gun” to track cell movement in the corneal healing process, and gene therapy to correct the fluid buildup that causes glaucoma. Other projects, such as the development of a new corneal glue and a revolutionary drug delivery system to treat severe inflammation, illustrate the power of collaboration with departments throughout Duke University and beyond.

I hope that you will enjoy learning about the Duke Eye Center and that you will be as excited as I am about the future of eye research at Duke.

Sincerely,

R. Sanders Williams, MD
Dean, Duke University School of Medicine
Vice Chancellor for Academic Affairs
Our friends and supporters, through their philanthropy and advocacy, have joined us in this quest to help us all realize our soaring aspirations for the future.

Applying basic science to our understanding of eye disease

David L. Epstein, MD

Over the past three decades the Duke University Eye Center has established itself as one of the leading eye institutions in the world. This reputation has been earned through the relentless pursuit of groundbreaking scientific research, the extraordinary collaboration of our world-renowned researchers and clinicians, an outstanding education program that draws students and trainees from the world over, and a commitment to providing the best and most innovative patient care available.

While we celebrate our achievements, we are mindful that, if we are to achieve our goals to eliminate eye disease and preserve vision, our aspirations require us to continue to expand our program. We must add transforming researchers and the latest scientific technology to achieve continuing innovation towards the cure for devastating eye diseases. We must continue to grow and expand our educational endeavors and our ability to share knowledge. And, always, we must provide the excellence in patient care that our patients expect and deserve.

Many of the world’s finest researchers and clinicians have joined the Duke Eye Center in our quest to understand and treat the diseases that steal sight. I hope that the stories that follow will also inspire you to share our aspirations and to work with others to preserve and restore one of the most precious gifts of all – the gift of sight.

Sincerely,

David L. Epstein, MD
Chairman
Duke University Eye Center
As Research Director, I will implement the goals articulated by our academic leadership: to enhance our research facilities based on cutting-edge technology, to facilitate teams crossing traditional boundaries to work together on a disease focus, and to accelerate the pace of translating laboratory knowledge to clinical applications.

Fulton Wong, PhD

Former University President Terry Sanford once eloquently characterized Duke as an institution with “outrageous ambitions.” Today, that ambitious spirit continues to thrive in the daily endeavors of the Duke University Eye Center. With the vision of a dreamer, the instinct of a scientist, and the compassion of a clinician, David L. Epstein, MD came to Duke University to lead the Department of Ophthalmology in 1992, and proceeded to build one of the finest disease-focused eye research programs in the world. The success of this program over the last decade now fuels the next stage of development of the Eye Center. The Albert Eye Research Institute is the fulfillment of this dream.

A key component of the Duke Eye Center’s success is our team approach: this commitment to clinicians and basic scientists working closely together is a hallmark of research at the Eye Center. As advances in the basic and clinical sciences take shape by leaps and bounds, the team approach provides the ideal vehicle for translational research—taking knowledge from the laboratory bench to the clinic to serve patients. The Albert Eye Research Institute will provide new opportunities for recruitment to enhance our existing research teams.

Our objectives cannot be achieved without the inspiring vision of our many loyal supporters. As their generosity and commitment are celebrated in these pages, it is clear that they are an integral part of the “outrageous ambitions” that inspire us to want to soar—to cure, to heal, and to serve.

Sincerely,

Fulton Wong, PhD
Research Director
Duke University Eye Center

Science is the key that unlocks the future
Perspective

Early detection and treatment of glaucoma can protect against vision loss

Charlie Gaddy, Retired WRAL-TV News Anchor and Glaucoma Patient

“When you give someone their sight, you are giving them life.”

Glaucoma is not a single disease, but a group of more than 50 distinct disorders that, together, are the most common cause of irreversible vision loss in the world. Glaucoma affects more than three million people in the U.S. and more than 60 million worldwide. Most cases of glaucoma result from increased pressure in the eye. In general, there are few if any symptoms. Vision loss occurs slowly, usually over many years. As a result, nearly half of those affected by glaucoma are unaware that they even have it. At its worst, glaucoma can lead to severe or total loss of vision. Unfortunately, the damage cannot be repaired. With early detection and treatment, however, serious vision loss may be prevented and vision preserved.

Charlie Gaddy: My father went legally blind from glaucoma in the 1950s when I was just a young boy. This really made an impression on me and caused me to watch closely over the pressure in my own eyes. Later in life when I was diagnosed with primary open-angle glaucoma, I crossed paths with the Duke Eye Center through a work project. I was so impressed with the Eye Center and its faculty and staff. It is comforting to me to know that some of the most cutting-edge research in glaucoma is going on right here at Duke—by some of the most skilled researchers in the world. It’s also nice to know that I can be treated by these same skilled doctors who may find a cure.

Mr. Gaddy and his wife, Nancy, have joined Duke in the quest to find a cure for glaucoma by serving on the Duke Eye Center’s Advisory Board for many years.
The Science of Glaucoma

The optic nerve is a bundle of more than a million nerve fibers connecting the retina—the light-sensitive layer of tissue at the back of the eye—to the vision centers in the brain. Normally, a clear fluid called the aqueous humor forms within the eye and circulates and nourishes the eye continuously. The fluid exits the eye through a delicate, spongy drain called the trabecular meshwork. When a blockage to the drain occurs and fluid is trapped, eye pressure becomes elevated and can cause damage to the optic nerve fibers responsible for carrying vision messages to the brain. This damage can result in a slow loss of vision.

Future Drug Treatments for Glaucoma

Duke Eye Center Chairman Dr. David L. Epstein has studied extensively the trabecular meshwork and worked towards achieving novel treatments for glaucoma that could be curative. His investigations have led to the development of several promising drug treatments that act by altering cell shape in the trabecular meshwork to allow more fluid to flow through. Dr. Epstein’s contribution to understanding the trabecular meshwork in both healthy and glaucomatous eyes has enabled fellow researchers to make great strides in the treatment of patients with primary open-angle glaucoma (POAG), the most common form of glaucoma, for which there is currently no specific treatment.

Gene Therapy

Now in its early stages at the Eye Center, gene therapy research could ultimately help restore normal function to the trabecular meshwork when the drain is not working properly. Drs. Pedro Gonzalez and Montserrat Caballero and their research team are working to identify the genes involved in the outflow of fluid through the trabecular meshwork under normal conditions and when glaucoma is present. They have already found that, under the stress of increased eye pressure, several genes in the meshwork are activated. Together with Dr. Epstein, these Duke researchers are collaborating on several genetic research projects to understand what causes the aqueous humor fluid to be unable to leave the eye normally, and to find and deliver new genes to the trabecular meshwork to restore the normal outflow process. These discoveries can lead to new treatments to prevent the increase in eye pressure that leads to glaucoma and its consequential damaging effects to vision.

Glaucoma research

Dr. Leon Herndon screens a patient for glaucoma. The test is painless, and everyone should be routinely screened for glaucoma. Patients of African-American descent have a four to six times greater risk of developing glaucoma. If detected early, the progress of the disease can be slowed with medication or surgery.
Although glaucoma cannot yet be cured, it can often be controlled with proper treatment. That's why early diagnosis is crucial to protect sight. Dr. Sharon Freedman is an expert in childhood glaucoma. Her research focuses on developing and evaluating optimal strategies for treating childhood glaucomas, including new medicines and modifications to surgical procedures used to treat adult glaucoma patients. Through her research, Dr. Freedman hopes to increase awareness and early diagnosis of this potentially blinding disease in children, and to preserve sight through appropriate medical and surgical therapy for our youngest patients. With the opening of the Albert Eye Research Institute, Dr. Freedman and her colleagues will work and serve in an advanced clinical care facility more conducive to the well-being of patients and their families. This new facility will provide spacious patient waiting and play areas and house delicate equipment for its optimal use in the quest for new and better ways to protect and reclaim lost vision in our youngest patients.

**Childhood Glaucoma**

Although primary open-angle glaucoma is the most common form of glaucoma worldwide, forms such as low-tension and normal-tension glaucoma, closed-angle glaucoma, and glaucoma related to trauma or inflammation also steal sight. While most people affected by this group of eye diseases are older, several rare types of glaucoma afflict infants and children. Dr. Sanjay Asrani is an expert in childhood glauca. Her research focuses on developing and evaluating optimal strategies for treating childhood glaucomas, including new medicines and modifications to surgical procedures used to treat adult glaucoma patients. Through her research, Dr. Asrani believes that this novel approach can someday help save the eyesight of thousands of people who currently lose their sight each year.

**Genetic Research Around the World**

Identifying individuals who are genetically predisposed to develop glaucoma is another important avenue toward early detection and treatment of this disease. Duke Eye Center Glaucoma Service Chief Dr. Rand Allingham collaborates with researchers around the world to identify the genes responsible for glaucoma. His innovative research is being conducted throughout the U.S. and in India, Africa, Iceland, and other regions. He is currently leading a major project in Ghana, West Africa, to help identify susceptibility genes for primary open-angle glaucoma, the leading cause of blindness in African-Americans. While POAG affects between two and six percent of the adult population, individuals of African-American descent are four to six times as likely to develop the disease. To understand this genetic link, Dr. Allingham and Drs. Leon Herndon and Pratap Challa have enrolled many Ghanian families with glaucoma into Duke’s POAG Genetic Linkage Study. In addition to collecting data, the Duke Eye Center team strives to teach these families and their local physicians to better manage glaucoma. Identification of the genes that cause the disease, along with an understanding of who is at highest risk of developing glaucoma, can lead to early diagnosis. The process of how glaucoma starts can also be discovered, creating the opportunity to develop entirely new treatments. Early detection is important because, while glaucoma cannot yet be cured, it can be controlled through medical and surgical treatment.
One of the greatest remaining challenges in eye research is to find a way to restore the vision of patients who have already lost their sight to diseases like glaucoma, macular degeneration, and retinitis pigmentosa. Today, most treatments can only delay or slow the progress of these diseases. Recent research advances in cell-based therapies have fueled excitement and brought us closer than ever to the possibility of someday finding restorative treatments for these devastating diseases.

Researcher and Developmental Neurobiologist Dr. Dennis Rickman is leading cell transplant research at the Duke University Eye Center. His research team is transplanting adult stem cells derived from the brain, bone marrow, and retina of adult animals into the diseased retinas of rats and mice. There are currently no therapies for successfully replacing retinal cells lost to degeneration. Dr. Rickman hopes his research may ultimately lead to a similar strategy for cell transplantation in diseased retinas of humans to restore sight that would otherwise be forever lost.

Dr. Rickman has also been working collaboratively with Dr. Epstein to initiate a program to restore sight to those with glaucoma by regenerating damaged tissue in the optic nerve.

Left: Adult stem cells (appearing here in green) from an adult rat brain have been injected into the diseased retina of a rat. Research shows that these transplanted cells have successfully engrafted and matured.

Right: Dr. Dennis Rickman discusses his vision of cell-based therapies and transplantation to restore retinal nerve cells lost to degeneration.
Perspective

Seeing the world differently after corneal transplant

Carolyn Wayne: I make my living as a seamstress and have worn eyeglasses since I was 12 years old. In my early forties, an eye doctor discovered that I had Fuchs’ Dystrophy. For the next 20 years or so, I lived with the deteriorating effects of this disease. When I asked my doctor what could be done to halt these effects, he told me there were currently no promising treatments available. I faced the real possibility that I might lose my vision. I was without hope.

Still, I sought help and turned to a family friend, who urged me to visit the Duke Eye Center as soon as possible. I came under the care of Dr. Terry Kim, who told me that my vision could be restored through the revolutionary process of corneal transplant surgery. One day, while struggling with the decision to go forward with the surgery, I sat next to a man at the Eye Center who was in an extra cheerful mood. I said, “You sure seem to be seeing it as a happy day today.” He replied, “Yes, I sure do, because I’m seeing it through the eyes of someone else!” Struck by a moment of revelation, I knew that this was my sign to move forward with the surgery. I told Dr. Kim, “Let’s go with it.” I recall the day the bandages were removed from my right eye: it was autumn and the leaves were changing. I don’t remember ever seeing the colors of the leaves so bright as I did on that day.

Carolyn Wayne now serves as an ambassador for the Duke Eye Center, sharing her story of hope with everyone she encounters.

“Dr. Kim is a wise and kind doctor, and I could never ask for a better one.”
Carolyn Wayne, Cornea Patient

After restorative surgery Dr. Terry Kim monitors Carolyn Wayne’s vision.
Cornea research

The Science of Corneal Disease
More than 4.3 million cases of corneal disease occur annually, resulting in discomfort, pain, or vision loss. The second most common blinding eye disease, corneal disease is generally caused by infection, injury, or dystrophy, a disorder that causes clouding of the eye.

The cornea is the transparent, dome-shaped window that covers the front of the eye. Because there are no blood vessels in the cornea, it is normally clear, functioning much like the outer lens of a camera. When light strikes the cornea, this lens bends—or refracts—the incoming light onto the paper-thin retinal tissue at the back of the eye. When the cornea is clear, a clear picture emerges. If the cornea is clouded by injury, infection, or dystrophy, the image will be faint and blurred, and vision loss may result.

The Klintworth Legacy
Under the leadership of Dr. Gordon Klintworth, the Duke Eye Center has built one of the finest corneal research programs in the world. Dr. Klintworth, a leading authority in ophthalmic pathology, has dedicated more than 40 years to research and teaching at Duke: a span that includes the entire life of the Eye Center. He has mentored several of Duke Cornea Service’s current leaders, who continue his pioneering research. An expert in genetics and inherited eye disease, Dr. Klintworth has collaborated with investigators around the world in his quest to bring new understanding to the molecular genetics of inherited diseases of the cornea and conjunctiva such as macular corneal dystrophy and hereditary benign intraepithelial dyskeratosis. Because inborn genetic errors can rob patients of their vision, Dr. Klintworth has sought to understand the basic nature of these diseases so that new treatments can be developed to restore vision. With the aid of emerging technology and the enthusiasm of a new generation of researchers, Dr. Klintworth believes that better methods of diagnosis and treatment for corneal diseases are just around the corner.

Dr. Gordon Klintworth shares his expertise with medical students.

Progress in Corneal Transplants
Corneal lacerations and perforations are common injuries that result from trauma, infection, inflammation, or other conditions. Corneal wounds are usually considered ophthalmic emergencies, and repairing them can be difficult. These wounds can cause clouding of the eye that prevents light from penetrating and reaching the light-sensitive retina, resulting in low vision or even vision loss. For serious cases, a corneal transplant may be necessary to replace the scarred or diseased cornea and restore vision. Approximately 45,000 corneal transplants are performed each year in the U.S. alone. At the Duke Eye Center, nearly 250 corneal transplants occur annually. In corneal transplant surgery, the surgeon removes the central portion of the clouded cornea and replaces it with a clear cornea, usually donated through an eye bank. The new cornea is sewn into the eye using fine thread that remains for months or years. Eyedrops help the healing process.

The Cornea Group, part of the Klintworth Legacy, will continue his pioneering work. Left to right: Cornea Service Chief Dr. Alan Carlson, and Drs. Natalie Afshari and Terry Kim.
Cornea research

Corneal Glue
Corneal transplant surgery and other eye surgeries can require delicate surgical skills and long spans in the operating room. To reduce instances of uneven healing, inadequate closure, infections, and scarring that can occur during these surgeries, the Eye Center’s Dr. Terry Kim and Dr. Mark Grinstaff are investigating the use of novel adhesives called biodendrimers for the treatment of corneal wounds. Biodendrimers are unique molecules that have the ability to form very strong bonds and to become activated by laser light. While Dr. Grinstaff synthesizes these molecules in his laboratory, Dr. Kim tests their ability to close various corneal wounds in human donor eye bank and animal eyes. Preliminary results show that these new adhesives seal wounds more quickly and efficiently than conventional sutures. Dr. Kim and his colleagues believe that these biodendrimers can be used to seal cataract and corneal transplant incisions as well as laser vision correction flaps. If these new adhesives continue to demonstrate successful results, they may change the way eye surgery is performed and offer patients a safer, faster recovery time following cataract, corneal, and refractive surgery.

Cataract Research
Cataracts—clouding of the normally clear lens inside the eye—are another leading cause of vision loss throughout the world. Currently, surgery is the only treatment for cataracts. Although surgical techniques have improved tremendously, surgery is still expensive and side effects are unavoidable. Dr. Vasanth Rao, a basic scientist at the Eye Center, is working to identify the cell signaling pathways involved in maintaining eye lens transparency and to understand their role in cataract formation. Using human lenses and animal model systems, Dr. Rao is employing a variety of research techniques to learn how lens cells communicate with one another and respond to external signals. He hopes his research will help identify cellular proteins and genes that can be targeted by new medical treatments for certain types of cataracts.

New Weapon: The Gene Gun
Drs. Fulton Wong and Natalie Afshari are investigating a new technique for gene delivery to the cornea using an innovative “gene gun.” By using the gun to mark corneal epithelial cells with a fluorescent protein “shot” into the cornea, the research team can track and study these cells as they move in the cornea. This technique may help the investigators identify the underlying mechanisms of corneal wound healing and, with continued success, could someday be used to facilitate gene therapy for treating human corneal diseases.

The green fluorescent glow from a protein “shot” into the cornea using a “gene gun” helps researchers track the movement of corneal epithelial cells during wound healing.

Gene Therapy
Because the cornea is located at the front of the eye, easy access makes it an ideal place to target gene therapy. Dr. Natalie Afshari is exploring new applications for gene therapy that could revolutionize treatment for corneal diseases. Today, the genes associated with many corneal diseases are not yet known, so Dr. Afshari and Dr. Gordon Klintworth lead a team of Duke Eye Center scientists in a search to identify these important genes.
Perspective

Mary Szabady: I’ve always enjoyed wonderful vision until one day, a few years ago, when I was teaching preschool. I leaned over and my eyesight flooded with floaters. It was so severe, I thought I was having a brain hemorrhage. I was rushed to the nearest doctor, who explained that floaters were not uncommon and that my vision appeared fine. Uncomfortable with this diagnosis, I continued to seek help: eventually, a local ophthalmologist determined that I had a severe eye disease known as pars planitis, a disease of the uveitis family. Because much of the research on this disease was limited and often contradictory, I desired to be under the care of not only a great clinician, but a great researcher: someone who sought to understand my disease and discover ways to slow or even halt it.

My quest led me to Dr. Glenn Jaffe at the Duke Eye Center, where I’ve been a patient ever since. By coming to Duke, I have complete confidence that I am receiving the best care available and that I always have access to the latest breakthroughs in treatment. Coming to the Duke Eye Center is the best decision I’ve ever made. Dr. Jaffe is treating my disease with steroids known as kenelog injections. Fortunately, I have not experienced any side effects and my eyesight is responding to the treatment. Dr. Jaffe instills a lot of trust and confidence in his patients, which is important since a positive outlook and low anxiety level are conducive to a successful treatment regimen.

Mary Szabady believes in giving back. Using her experience and passion for teaching preschool children, she teamed with family, friends, and the Duke Eye Center to create a CD-ROM with fun and colorful art activities for kids. Half of the purchase price for each CD benefits the Duke Eye Center’s Building Fund.

Peace-of-mind in finding the best care

“By coming to the Duke University Eye Center, I am assured that I always have access to the latest breakthroughs in treatment.”

Mary Szabady, Retina Patient
The retina—the light-sensitive tissue that lines the inside of the eye—is where the eye’s miraculous ability to transform light into vision begins. It is also the site of some of the most serious eye diseases, including those that can result in vision loss. The retina consists of two types of light-sensitive photoreceptor cells: cones and rods. Rods are found near the edges of the retina and are used to see in dim light or to see items to the side of our line of vision. Cones are concentrated near the center of the retina—the macula—and are responsible for seeing color and detail in good light conditions. At the center of the macula is the fovea, which is responsible for the eye’s fine detailed vision.

Age-Related Macular Degeneration (AMD) is the leading cause of vision loss in people over 50. It affects more than 12 million Americans, a number expected to double by 2020 as baby boomers age. The degeneration of the macula eventually robs individuals of their ability to see color, sharpness, and clarity. AMD exists in dry and wet forms. With the dry form, yellow deposits called drusen accumulate under the macula and can thin the retinal layers, leading to vision loss. In the wet form, abnormal blood vessels grow behind the retina and leak blood and fluid, resulting in severe vision loss over weeks or months as the cone cells that mediate fine vision are lost. Although the dry form is more common, the wet form of AMD leads to the most irreversible vision loss.

Retinitis Pigmentosa (RP) is a group of hereditary eye disorders for which there are limited treatments and no cures. RP is usually detected when a teenager loses the ability to see well at night. This vision loss is caused by the death of the eye’s rod cells. Although RP patients lose the function of their rod cells early in life, their cone cells remain functional for many years, allowing them to keep their daytime vision for much longer. Over the course of a few decades, the cone cells gradually begin to deteriorate as well, leaving patients with severe vision loss.

Revealing the Disease Mechanisms of Retinitis Pigmentosa
At least 30 genetic mutations and genomic sites have already been linked to different forms of retinitis pigmentosa, evidence of the complexity of the blinding eye disease. Many important questions about the underlying disease mechanisms are still unanswered. Dr. Fulton Wong’s pioneering research focuses on answering the most critical questions by identifying the non-genetic, cellular mechanisms common to the progression of this disease. Dr. Wong believes that these mechanisms would be ideal therapeutic targets, because intervention at these sites may prove to be effective for large groups of patients. A collaboration between Dr. Wong and his colleagues from North Carolina State University has resulted in the creation of a genetically engineered pig model for RP. As with human RP retinas, these pig cone photoreceptors survive much longer than their rod photoreceptors, allowing Dr. Wong and Dr. You-Wei Peng to discover synaptic abnormalities in these degenerating retinas. This discovery has far-reaching implications for the disease mechanisms of RP and for designing therapeutic strategies.

Uveitis Drug Delivery
Uveitis—severe inflammation of the eye—can cause tremendous pain, light sensitivity, decreased vision, and sometimes blindness. Dissatisfied with current treatment regimens that may be ineffective or have intolerable side effects, Dr. Glenn Jaffe is leading the effort to understand and treat chronic uveitis. Dr. Jaffe is studying new experimental devices that can be implanted in the eye to deliver drugs directly to the area that needs treatment. Once surgically implanted into the patient’s eye, the tiny device can release medication over a period of weeks, months, or even years. In time, related new technologies may help treat not only uveitis, but also other diseases that can cause vision loss.
Perspective

Vigilance of patient and doctor pays off

“AMD took the everyday things in my life away from me; Dr. Toth and this surgery have given them back again.”

Alice Haynes, Age-Related Macular Degeneration Patient

The Battle Cry: Save the Cones

The success of future age-related macular degeneration therapies lies in their ability to preserve, protect and eventually even restore cone photoreceptors and their function, since it is ultimately the loss of these cells and the sharp color vision they mediate that results in devastating vision loss in AMD. Dr. Catherine Bowes Rickman is leading a team of Duke Eye Center researchers that has made great strides in identifying the genes expressed in cone cells and is determining the role these genes play in degenerative retinal diseases such as AMD. Dr. Bowes Rickman hopes that this research will contribute to our basic understanding of cone photoreceptor biology and the changes that take place through degenerative disease processes. These findings may lay the groundwork to develop therapies that prolong photoreceptor survival in macular degeneration and, ultimately, prolong sight.

“The need for new science to cure macular degeneration.”

David L. Epstein, MD

Dr. Catherine Bowes Rickman is searching for the genes associated with age-related macular degeneration.

“Sharing the story of her miraculous experience has helped make Alice Haynes a special ambassador for the Duke Eye Center.”

Dr. Catherine Bowes Rickman is searching for the genes associated with age-related macular degeneration.

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Dr. Catherine Bowes Rickman is searching for the genes associated with age-related macular degeneration.
The Duke Center for Macular Degeneration (AMD)  
Believing that the needs of macular degeneration patients and their families go beyond simply medical concerns, the Eye Center has established The Duke Center for Macular Degeneration to develop and provide new forms of education, research, and patient care for those facing this sight-stealing disease. The AMD Center, directed by Dr. Michael Cooney, takes a multidisciplinary team approach to its goal to improve care and quality of life for AMD patients and their families.

The Duke Center for Macular Degeneration strives to enhance and integrate existing AMD programs and services such as vision rehabilitation, clinical care, macular translocation surgery, and AMD research with entirely new programs such as patient and family support and the Duke Macular Degeneration Learning Institute. The first program of its kind, the Learning Institute provides comprehensive, ongoing education programs for patients, community members, physicians, and staff.

The AMD Center also provides a framework for basic science and clinical researchers to work together to develop new therapies and preventive strategies for macular degeneration. By providing a unique environment that cultivates teamwork and continuous learning, The Duke Center for Macular Degeneration aims to make life better for the millions currently afflicted with AMD, even as we lay the groundwork for the day when macular degeneration will be cured.

Macular Translocation Surgery  
A Duke vitreoretinal surgeon has worked to perfect a novel treatment for AMD called Macular Translocation 360 Surgery. The achievement by Dr. Cynthia Toth is based on the pioneering research of former Duke Eye Center Chairman Dr. Robert Machemer. The goal of this surgery, for patients who are losing the last of their central vision to AMD, is to lift the macula away from underlying abnormal blood vessels and move it to a new, healthier location to restore central vision. This procedure has already helped many AMD patients who had little or no hope of seeing again, to be able to resume many daily activities.

A multidisciplinary Duke Eye Center team is working to fine-tune this complex technique, which can now be performed on an outpatient basis, to reduce recovery time and improve outcomes for patients with severe AMD. Drs. Sharon Freedman and Laura Enyedi are performing follow-up surgery to correct the tilted vision that is a common side effect of macular translocation surgery. Duke doctors are also training vitreoretinal surgeons around the world to perform this pioneering surgery.

Clinical Trials for Wet Macular Degeneration Patients  
Dr. Sharon Fekrat is the lead investigator at the Duke Eye Center for two exciting multicenter, national clinical trials for patients with wet macular degeneration. Transpupillary Thermotherapy (TTT), uses a warm laser to heat the abnormal blood vessels that grow in wet macular degeneration. TTT may ultimately lead to visual stabilization, and in some cases, improvement of sight. Other studies involve the administration of investigative medications into the eye that may halt or slow down the abnormal growth of blood vessels under the macula. Dr. Fekrat believes both new research approaches offer hope to those who suffer from the devastating effects of wet macular degeneration. A broad array of clinical trials for macular degeneration are being planned at the Duke Eye Center.
Pediatric Eye Care

Because a child’s visual system develops until about age eight, early problems with vision, if untreated, can lead to a lifetime of poor vision. For this reason, regular eye exams and early diagnosis and treatment of eye problems are of the utmost importance.

The Duke Eye Center’s Lions Pediatric Eye Clinic sees 12,000 children each year for routine exams and specialty care, including many kids who have received care since birth.

Optimizing Sight, Right From The Start

The pediatric division of the Duke Eye Center handles a broad spectrum of eye problems in young patients, from the relatively simple but important problems of fitting eye glasses on babies and treating ‘lazy eye,’ to the complex issues involved in treating children with glaucoma, cataracts, retinopathy of prematurity, and retinoblastoma. When the new Albert Eye Research Institute opens its doors, the second floor of the Institute will be home to the new Pediatric Eye Service, a much-needed expansion of the existing facility. With plenty of space and windows, the new pediatric area will feature a lighter and brighter atmosphere specifically designed for the comfort and care of children and their families. Expanding the growing clinical research program in this facility, while also incorporating pediatric low vision services, family counseling, play therapy, and other critical areas of treatment will help improve the quality of pediatric eye care and foster the development of treatments to restore sight in our youngest patients.

“Dr. Buckley will always hold a special place in my heart. If it wasn’t for him, I probably wouldn’t be able to see how I see now.”

Mindy Brooks, Pediatric Ophthalmology Patient

Collaborating on the latest in pediatric eye care are Drs. Laura Enyedi, Sharon Freedman, and Pediatric Ophthalmology Service Chief Dr. Ed Buckley.
A soaring aspiration to serve others

“When it came time to make the gift of a lifetime for medical research, we had no doubt about where to place our trust as well as our resources.”

**Herman Albert 1922-2002**

The Duke University Eye Center aspires to be the leading eye center in the country – second to none – for scientific innovations that will transform the treatment of eye disease. To make our soaring aspirations a reality, the Eye Center relies on the generosity of friends who support our programs directed at blinding eye diseases. These benevolent individuals have each built a relationship with the Duke Eye Center often through their own or a loved one’s experience facing vision loss from eye disease. As a result of their experiences, they have stepped forward to help us achieve our vision for the future.

Duke Eye Center supporters contribute in many ways: as benefactors, ambassadors, and advocates. Ruth Albert, a grateful patient of Dr. Alan Carlson, and her husband, the late Herman Albert, initially presented Dr. David Epstein with an endowment fund for eye research with a goal that “through research others might not suffer from eye disease.” Subsequently, the Alberts made history with the magnitude of their $8 million gift to help us begin to build an Eye Research Institute at Duke.

**We need you.**

The Albert Eye Research Institute, and, ultimately, a new clinical pavilion are essential to the Eye Center’s ability to achieve the innovative research and goals described on these pages. Your gift will allow us to provide our researchers with state-of-the-art laboratories, support, and equipment needed to understand the causes of eye disease, discover more effective treatments, and preserve vision for generations to come.

Top Left: Motivated by their desire to help others facing eye disease, Ruth and her late husband Herman Albert, donated $8 million to the Duke University Eye Center to help create the Albert Eye Research Institute.

Top Right: Groundbreaking ceremony for the Albert Eye Research Institute, Fall of 2002. Chairman Dr. David L. Epstein, Leonard and Rose Herring, Ruth Albert, and Dr. Alan Carlson.

Bottom Left: Evelyn Hunter-Longdon honored her late husband, Stanley Longdon, with a building fund gift of $1 million.

Bottom Right: The Albert Eye Research Institute, scheduled to open 2004-2005, will provide much-needed space and resources for the Eye Center’s growing research, patient care, and education endeavors.
Driven to help others living with eye disease, the Wannamaker family generously made a $2.5 million gift to the Duke Eye Center.

People from all walks of life experience potentially blinding eye conditions. While some families are blessed with plentiful resources from which to give, others give as they can to advance the treatment of eye disease. Gifts to the Duke Eye Center at all levels make a difference in our quest to create a future free of eye disease.

The Eye Center welcomes gifts in many forms, from checks and credit card donations, to gifts of stock, to namings of the Center in wills and trusts. Our staff can guide you as you decide how best to give to meet your current income needs and minimize tax liability.

The Eye Center also encourages donations of time, whether as a volunteer, a clinical trial participant, or by simply serving as an ambassador for the Eye Center in your daily life.

With your help, we will realize our soaring aspirations to cure, to heal, to serve. Together, we can win the battle against blinding eye disease.
We aspire to be the leading eye center in the country—second to none.

We aspire to apply the latest in science to the treatment of blinding eye disease, while continuing to provide true excellence in patient care and training the next generation of leaders in scientific and clinical ophthalmology. In all of our missions, we aspire to be second to none.

With your support, the Duke University Eye Center will realize our soaring aspirations— to cure, to heal, to serve—and ultimately, to win the battle against blinding eye disease.

Duke University Eye Center
DUKE UNIVERSITY HEALTH SYSTEM
Planning and Development Office
Box 3882, Erwin Road, Durham, NC 27710
919.684.3182 • www.dukeeye.org

“Soaring aspirations to cure, to heal, to serve.”