



# YALE EYE

For Friends, Patients and Alumni of Yale Eye Center

FALL 2008

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## INSIDE THIS ISSUE

Z. Jimmy Zhou, Ph.D.  
page 1

Umbrella Club of Stamford  
page 1

Chairman's Message  
page 2

Meet Pamela Jean Berkheiser  
page 2

Jimmy Lee, M.D.  
page 3

New Glaucoma Operation  
page 3

Yale Residents in  
Ophthalmology  
page 4

Homer Rees Endowment  
page 5

Meet David Zenisek  
page 6

Alumni News  
page 7

CME and Coming Events  
page 8

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## Z. Jimmy Zhou, Ph.D., *New Director of Research*



Z. Jimmy Zhou, Ph.D., has been appointed Vice Chair and Director of Research in the Department of Ophthalmology and Visual Science. Zhou is an internationally recognized authority on the physiology and development of the mammalian retina with a focus on retinal synaptic function and organization. Recently, Dr. Zhou

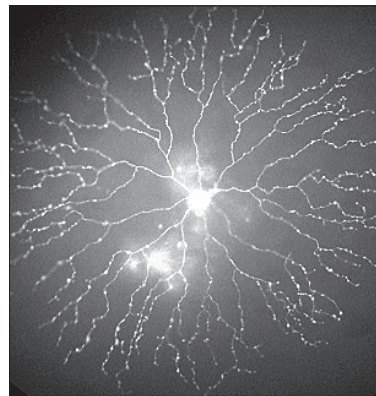
and his team have studied the “starburst” amacrine cell in the retina and elaborated on the mechanism of its spontaneous rhythmic activity (*similar to pacemaker heart cells*).

Dr. Zhou, born in Shanghai, China, studied nuclear physics at Fudan University. Upon graduation, he received his Ph.D. at the University of Houston through the CUSPEA (*the China-United States Physical*

*Examination and Application*) program, organized by Nobel Laureate T. D. Lee of Columbia University. At Houston, Zhou studied physics with Professor Paul Chu, now President of the University of Science and Technology in Hong Kong. Zhou then turned his interest to physiology and biophysics, completing his doctorate with Lam and Brown at Baylor, and postdoctoral studies at UCLA under Gordon Fain. He had been on faculty at the University of Arkansas since 1996.

At Yale, Dr. Zhou will be working with Dr. Tsai to recruit four additional faculty members to expand vital areas of basic and translational research, and to help establish the Department as an international leader in vision research.

*continued on page 7*



## Umbrella Club of Stamford Supports Pediatric Eye Center

On June 5, the Yale Eye Center hosted Mr. Robert Giangoia, President of the Umbrella Club of Stamford, and nine club members for a tour of its clinical facilities at 40 Temple Street, and new research facilities at the 300 George Street building. Mr. Rocco Cingari, Chairman of the Yale Eye Center Advisory Board, and an Umbrella Club member, was the driving force behind alerting the organization to the need for

*continued on page 2*



## Chairman's Message



Dear Friends:

Exciting advances are continuing to be made every day at the Yale Eye Center. With the successful recruitment of leading clinicians and scientists to our department, our Department is becoming a nationally recognized center of excellence in eye care, offering patients the full spectrum of ophthalmic subspecialties with cutting edge technology and surgery. With the move of our Basic Science Research Section into modern, state-of-

the-art research facilities at the 300 George Street building, and the arrival of new investigators, the Department has become a leader in translational vision research.

In this issue, we welcome Z. Jimmy Zhou, Ph.D., Vice Chair and Director of Research. Dr. Zhou comes to Yale from the University of Arkansas where he served as Professor of Physiology and Ophthalmology and led a successful laboratory research program with two NEI RO1 grants. We also welcome Jimmy Lee, M.D., our newest clinical faculty member, who joins us following his clinical and research fellowship in cornea and refractive surgery at Johns Hopkins University / Wilmer Eye Institute. We also highlight leading edge basic research being undertaken by David Zenisek, Ph.D., Associate Professor of Cellular & Molecular Physiology and Ophthalmology & Visual Science, and the exciting development of an aqueous shunt surgical device patented by M. Bruce Shields, M.D.

This past spring, we had the pleasure of hosting two vision research updates for our patients and friends. I am extremely appreciative of the superlative lectures delivered by outstanding clinician-researchers and scientists: C. Robert Bernardino, M.D., Josephine Hoh, Ph.D., John Huang, M.D., Jimmy Lee, M.D., Daniel Salchow, M.D. and Ning Tian, Ph.D. In addition, we take enormous pride that M. Bruce Shields, M.D., has been honored with two prestigious awards: a Lifetime Achievement Award from the American Academy of Ophthalmology, and the American Glaucoma Society's Guest of Honor Award. Finally, we hosted two important medical conferences this coming fall: Our 12th Annual Glaucoma Symposium at Water's Edge Conference Center, Westbrook CT, featuring R. Rand Allingham, M.D., as the 2nd M. Bruce Shields, M.D. Lecturer, and the Eye Center's Festschrift honored Marvin L. Sears, M.D., founding chairman of our department, for his lifetime scientific achievements.

Best wishes,

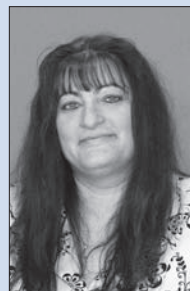
James C. Tsai, M.D.

Robert R. Young Professor and Chair



## Meet

## Pamela-Jean Berkheiser



Pamela-Jean Berkheiser, Practice Manager for the Yale Eye Center, has worked in health care management for 25 years, supervising the accounting and payroll operations of several Health Management Organizations and medical practices in

Connecticut. Her responsibilities at the Yale Eye Center include analyzing statistical data to ensure the efficient operation of the Department, and supporting and implementing programs to increase patient satisfaction.

Ms. Berkheiser is enthusiastic about the move to 40 Temple Street. "The new facility is spacious and beautifully designed to facilitate workflow, maximize our ability to take care of patients, and decrease patient wait times. In addition to our new state-of-the-art equipment and examination rooms, we will be acquiring new technological instruments that will enable the clinician-scientists to conduct clinical trials and enhance diagnostic services. She adds: "We look forward to welcoming patients from the greater New Haven Community to Yale, and we are dedicated to working hard as a committed team of physicians, technicians, and staff to improve Vision Health in Connecticut." Ms. Berkheiser has three children, and is the proud grandmother of her first granddaughter.

### Umbrella Club of Stamford, continued from page 1

support of Yale's vision programs. The members of the Umbrella Club, an especially social and lively group, enjoyed a reception followed by comments by Dr. Tsai and a presentation by Daniel J. Salchow, M.D., about the future plans for a Pediatric Eye Center at Yale. To show its strong support, the Umbrella Club has already made a leadership commitment of \$250,000 to make this Center possible.

## Dr. Jimmy Lee Takes the Lead of Cornea / Refractive Surgery at Yale



The Yale Eye Center welcomes to its Cornea, External Disease, and Refractive Surgery Section Dr. Jimmy K. Lee, as Assistant Professor of Ophthalmology & Visual Science. Dr. Lee graduated from Cornell Medical School, served his residency training at Albert Einstein – Montefiore Hospital, and completed his clinical cornea fellowship at Wilmer Eye Institute, Johns Hopkins University.

Dr. Lee is enthusiastic about the future of Yale as a major eye center in the northeast, and his arrival strongly enhances the faculty assembled by Dr. Tsai with his specialized clinical and surgical

skills. Dr. Lee will provide state-of-the-art laser vision correction, corneal transplantation, and cataract surgery with premium intraocular lens implantation, and expand Yale's clinical expertise in treating patients with myopia, hyperopia, presbyopia, and astigmatism.

Dr. Lee's research interests include the assessment of new technologies in refractive surgery, new corneal transplantation procedures for Fuch's Dystrophy, endothelial keratoplasty, femtosecond laser for corneal transplantation, limbal stem cell transplantation, and artificial corneas. All these techniques improve recovery times and enhance visual acuity for patients suffering from challenging corneal and cataract abnormalities. Dr. Lee is also working on improved therapy for patients with dry eye syndrome, and to help patients recover from the discomfort due to limited tear production.

Dr. Lee states, "I look forward to joining the Yale Eye Center to offer the latest in cornea, cataract and refractive surgery, including a new technique I developed myself for corneal surgery, and to research new exploratory ways of treating complex corneal diseases."

### NEW GLAUCOMA OPERATION

#### *The Shields Shunt*



*Despite remarkable advances in ophthalmic surgery in recent decades, especially in the fields of cataract, cornea and retinal surgery, there is still a need for better*

*operations to control the intraocular (eye) pressure in patients with glaucoma. A major problem with current operations is that they drain the eye fluid (aqueous humor) to a superficial part of the eye called the conjunctival space, where tissue reaction can lead to scarring and failure in some cases and breakdown with leakage and infection in others.*

*Dr. Bruce Shields has been developing a new glaucoma operation, in which a shunt drains fluid to another part of the eye, called the suprachoroidal space, which reduces the risks associated with current procedures. In 2006, he received a US patent for his invention and, with the help of the Office of Cooperative Research at Yale, a start-up company, called Vidus Ocular, was created to develop the concept. After successful pre-clinical trials, the company was acquired by OPKO Health in Miami, Florida, which hopes to start clinic trials before the end of this year.*

*Dr. Shields is hopeful that this new operation will not only provide better hope for the thousands of people afflicted with glaucoma in the US and other developed nations, but especially in developing parts of the world, where glaucoma is a leading cause of blindness and for which there is currently no practical treatment.*



### Research to Prevent Blindness

Research to Prevent Blindness (RPB) has awarded a four-year challenge grant of \$220,000 to the Department of Ophthalmology at Yale University School of Medicine to spur the development of advanced research into the causes, treatment, and prevention of blinding diseases. The research will be directed by James C. Tsai, M.D. Chairman of the Department of Ophthalmology. RPB is the world's leading voluntary organization supporting eye research.

James C. Tsai M.D., the Robert R. Young Professor and Chairman of the Department of Ophthalmology and Visual Science, has focused the energies of the basic scientists and clinicians towards forming collaborations that will result in promising translational research. His own research has involved exploring the potential benefits of neuroprotective and neuroregenerative treatments for glaucoma. Tsai notes, "We are extremely grateful to RPB for their generous support of the vision research program at Yale. Our goal is to accelerate the rate of scientific discoveries and translate these results into meaningful treatments for our patients in need." Since it was founded in 1960, RPB has channeled hundreds of millions of dollars to medical institutions throughout the United States for research into all blinding eye diseases. For information on RPB, RPB-funded research, eye disorders and the RPB Grants Program, go to [www.rpbusa.org](http://www.rpbusa.org).

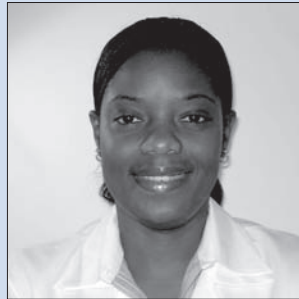
# Yale Residents in Ophthalmology



**DEANNE NAKAMOTO, M.D.**  
*Chief Resident*  
 B.A. Harvard  
 M.D. Yale



**VINCENT DIAZ, M.D.**  
*Senior Resident*  
 B.A. Brown  
 M.D. Yale



**DAWN RUSSELL, M.D.**  
*Senior Resident*  
 M.D. West Indies, St. Augustine



**ALISON CRUM, M.D.**  
*Second Year Resident*  
 B.S. Stanford  
 M.D. University of Washington, Seattle



**ANITA HWANG, M.D.**  
*Second Year Resident*  
 B.S. UCSD / M.S. Georgetown  
 M.D. SUNY Buffalo



**RALUCA RADUCU, M.D.**  
*Second Year Resident*  
 M.D. University of Medicine and  
 Pharmacy Carol Davila



**JAVIER SERVAT, M.D.**  
*Second Year Resident*  
 M.D. University San Martin de Porres



**OMAR CHAUDHARY, M.D.**  
*First Year Resident*  
 B.S. Duke  
 M.D. Yale



**MATHEW GEORGE, M.D.**  
*First Year Resident*  
 M.B.B.S. Ramaiah Medical College



**JOSEPH LIN, M.D.**  
*First Year Resident*  
 B.A. Northwestern  
 M.D. Johns Hopkins



**CHRISTINA PRESCOTT, M.D., PH.D.**  
*First Year Resident*  
 B.A. Columbia  
 M.D., Ph.D. U. Colorado Health Sciences Ctr.



**ERIC SIGLER, M.D.**  
*First Year Resident*  
 B.S. SUNY Albany  
 M.D. SUNY Buffalo



*Smiles at Commencement (L-R): Dr. Bruce Shields, Erica Fritz, 2008 Fellowship graduates Amir Cohen (glaucoma) and Rosaliz Portela, M.D. (retina), Residency graduates Michelle Wang, M.D., Ph.D., Gelareh Abedi, M.D., Cinthia Covey, M.D., Rajee Seth, M.D., with Chairman James C. Tsai, M.D.*

## Homer McK. Rees Endows Research and Lectureship Fund



Photo by Chi Chi Ubiña

In the last decade, remarkable progress has been made toward understanding debilitating diseases of the eye, such as age-related macular degeneration (AMD), the leading cause of blindness in the developed world. Some of the most important contributions in the genetics of AMD have been made by the School of Medicine's Josephine J. Hoh, Ph.D., associate professor of epidemiology and of ophthalmology and

visual science. In 2005, Hoh and colleagues compared the DNA of patients with AMD to those who didn't have the disease, and linked a variant of a gene known as CFH with the milder "dry" form of AMD. In 2006 a group led by Hoh went on to identify a single change in a gene on chromosome 10 that leads to a significantly increased risk of developing the more aggressive "wet" form of the disease. Hoh's research was named one of the top 10 scientific breakthroughs of 2006 by the leading journal *Science*.

"Discovery of the association of CFH and AMD changed the direction of macular degeneration research," Hoh says, adding that one of the most rewarding aspects of her work has been the collaboration it has sparked with other scientists.

Homer McK. Rees, former chairman of Prudential Capital Corporation, is a long-time patient of glaucoma expert James C. Tsai, M.D., M.B.A., chair and Robert R. Young Professor of Ophthalmology and Visual Science. A member of the Yale College Class of 1951, Rees decided to support the cutting-edge eye research and patient care taking place in Tsai's department by establishing the Homer McK. Rees Research and Lectureship Fund in April, 2008.

This endowed fund has been designated for a variety of uses in

support of clinical care, education and research in the subspecialty of glaucoma. This includes support of a Homer McK. Rees Lectureship to regularly bring notable experts in the field to Yale; support of ground-breaking basic, translational and clinical research; and the acquisition of new technology, instruments and clinical facilities for glaucoma.

In April, Rees and his wife, Coverly, hosted a well-attended cocktail hour, dinner and informational session at the Stanwich Country Club in Greenwich to promote the Yale Eye Center. The evening, which featured presentations from Tsai and Hoh, highlighted new research trends and best practices in the treatment of glaucoma and macular degeneration.

In addition to his generosity toward the School of Medicine, Mr. Rees has also served in many leadership capacities for other philanthropic community organizations and medical institutions, including serving as an advisory board member for Edward S. Harkness Eye Institute at the Columbia University College of Physicians and Surgeons; serving as director and treasurer of the Bruce Museum in Greenwich, Conn.; and working as director of the Greenwich Symphony Orchestra, to name just a few.

### ***Congress Helps Donors Make Gifts to Support Yale School of Medicine Department of Ophthalmology and Visual Science***

*Congress has passed the Emergency Economic Stabilization Act of 2008, which makes it easier for owners of individual retirement accounts (iras) who have reached the age of 70 or older to make qualified charitable distributions directly from their ira to charities such as Yale School of Medicine. Such individuals may now transfer up to \$100,000 directly from an ira to the Yale Eye Center. These distributions are not subject to federal income tax and can satisfy minimum distribution requirements; the program is effective for charitable transfers made during 2008 and 2009. In these challenging economic times, the ira Charitable Rollover may provide a tax-efficient means for you to support medical education, eye research or patient care at Yale School of Medicine Department of Ophthalmology and Visual Science. For more information about this opportunity or other giving opportunities please visit [www.eyes.yale.edu](http://www.eyes.yale.edu) or contact Richard Gallette, Area Development Director, at 203-436-8529.*

## David Zenisek, Ph.D.: Visualizing Fluorescent Proteins



David Zenisek, Ph.D., is Associate Professor of Cellular & Molecular Physiology and Ophthalmology & Visual Science at Yale. He completed his Ph.D. at SUNY-Stony Brook in the field of neuroscience, with studies in calcium action potentials and calcium handling in goldfish retinal bipolar cells. Subsequently he served postdoctoral fellowships at the Vollum Institute in Portland, Oregon, and the Max Planck Institute in Heidelberg, where, with Dr. Wolfhard Almers, he investigated evanescent field imaging of single vesicles in goldfish retina, exploiting their enormous synaptic terminals. He perfected a novel way to detect synaptic vesicles using TIRF (total reflection fluorescence microscopy), and to take both electrical and optical recordings. He was recruited to Yale in 2002.

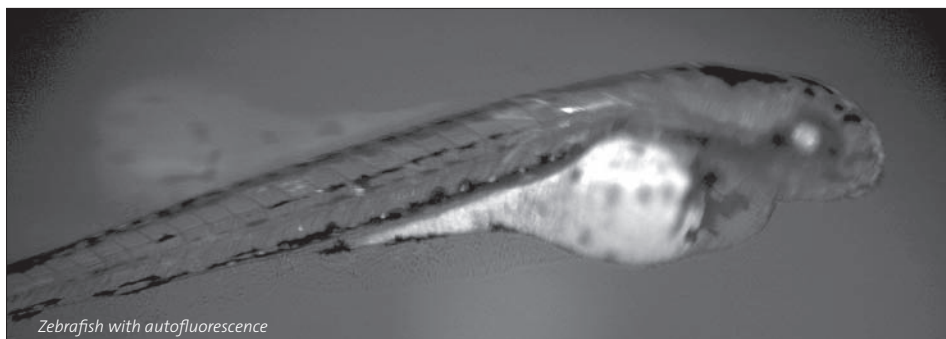
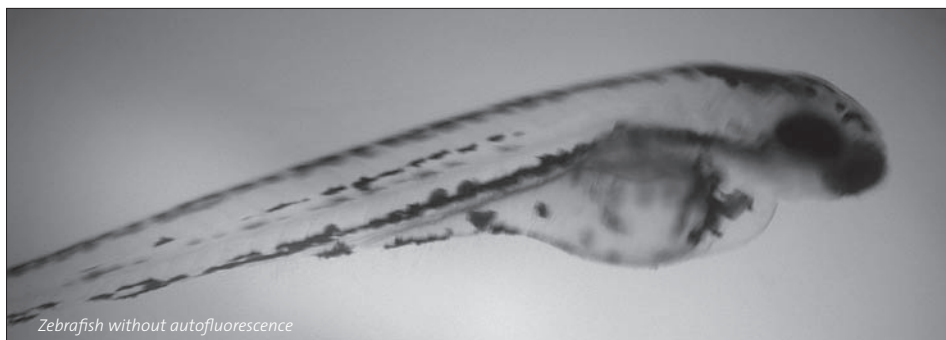
Dr. Zenisek explains, “If you take light from an acute angle, from a high refractive index to a low refractive in-

dex, you can get a total internal reflection with no light propagating into the lower refractive index media. It is like being in a swimming pool: If you try to look out at an angle, you can only see the reflection. Even though the light does not propagate into the less dense media, it actually penetrates it a little bit, and where it penetrates, it generates an evanescent – gradually vanishing – field. This field decays exponentially with distance from the interface and does so very sharply.”

Using a high refractive index glass, and a cell that is adherent to that glass, Dr. Zenisek uses light to excite fluorescent molecules, such that he can view things right at the cell surface. Because the fluorescent light comes from within the focal plane, he can look deeper into the cell. Because the light decreases with distance, as an object moves closer, it gets brighter, and as it moves further away, it gets dimmer. “Now we have a very sensitive

measure of movement toward a membrane or away from it. We can use this to look at vesicles moving in the adherent cell.”

Zenisek studies how these cellular mechanisms work to better understand how genetic mutations correspond to certain diseases, such as Usher’s Syndrome, which affects both vision and hearing. As he looks to the future of his laboratory work, he plans to use transgenic mice and zebrafish to continue study of mutations that affect vision. By tagging proteins with fluorescent markers, he can visualize protein movement within a cell, or, in the case of the zebrafish, within a living animal. He will collaborate with Dr. Josephine Hoh, Associate Professor of Epidemiology and Public Health, and Ophthalmology and Visual Science, to develop a transgenic zebrafish that over-expresses macular degeneration genes for future studies in age related macular degeneration.





**National Glaucoma Leaders at 12th Annual Yale Symposium in Westbrook, CT**

On September 5, over 140 individuals gathered at the Water’s Edge Conference Center to enjoy the 12<sup>th</sup> Annual Yale Glaucoma Symposium, “New Horizons in Glaucoma Diagnosis and Treatment.” This annual event, inaugurated by former Chairman Dr. Bruce Shields, featured leading glaucoma authorities from across the nation, pictured above in the faculty group (L-R, back row) Dr. Leon Herndon, Dr. Mark Latina, Dr. David Friedman, Dr. Bruce Shields (Course Co-Director), Dr. Rand Allingham, Dr. Richard Parrish, Dr. Dale Heuer. (L-R, front row) Dr. James Martone, Dr. James Tsai (Chairman and Course Co-Director), Dr. Janet Serle, Dr. Hylton Mayer, Dr. Peter Branden, and Dr. Bruce Altman.



**Rosaliz Portela, M.D.**, completed a clinical retina fellowship in June with Drs. Kathleen Stoessel, Ron Adelman, Armand Daccache, and John Huang. She has relocated to her native Puerto Rico, where she will provide retina service in San Juan at the Centro Oftalmologico Metropolitano.



**Amir Cohen, M.D.**, completed a clinical glaucoma fellowship in June with Drs. James Tsai, Bruce Shields, and Hylton Mayer. We are proud to report that Amir has been appointed Assistant Professor at the New Jersey Medical School Institute of Ophthalmology and Visual Science, and now works with Dr. Robert Fechtner in the Glaucoma Division.



**Marvin Sears: Physician, Scientist, Mentor**

On October 2 and 3, the Department of Ophthalmology and Visual Science honored our founding Chairman, Dr. Marvin L. Sears, with a two-day scientific program and related celebrations. Visiting faculty traveled from Sweden, German, Chile, Japan and Canada, as well as from across the U.S. to pay tribute to their colleague and to present current findings on amblyopia, retinal disease, and glaucoma. Alumni of the residency program from as far back as the 1960’s also attended. Keynote speaker, former Medical School Dean Leon E. Rosenberg, M.D., shared reflections on his career as a physician/scientist, and is pictured at center left with Dr. Sears in this group photo. Dr. Sears’ son Jonathan, now Associate Professor at Cleveland Clinic, and Dr. Sears’ grandson, Nathan, a member of the Class of 2011 at Lerner College of Medicine, round out three generations of scientists in the Sears family.

**Z. Jimmy Zhou, Ph.D., continued from page 1**

This work will draw on the talent of many of Yale’s Departments and Centers, including Neurobiology, Cellular and Molecular Physiology, Genetics, Public Health, Molecular and Cellular Biology, and Stem Cell Research, as well as national and international collaborations with other institutions.

Dr. Zhou states “We need brilliant and energetic people of broad scientific backgrounds, who can join forces in understanding the function and diseases of the visual system, thereby translating basic research results into clinical breakthroughs. I have always thought of myself as a student, and I greatly appreciate the opportunity to learn from and work with scientists in diverse disciplines.”

# Yale Eye Center Conference Schedule

**September 26**

**M&B Conference**

**Robert Bernardino, M.D., Host**

**Dr. I. W. Abrams**

Clinical Professor

*"Clinical Challenges in International Ophthalmology – Afghanistan"*

**October 2-3**

Festschrift to Honor **Marvin L. Sears, M.D.**

Hope Auditorium, 315 Cedar Street

**October 10**

**Don Liu, M.D.**

Professor, Vice Chair, Director of Oculo-plastic / Orbital Surgery, Department of Ophthalmology, University of Missouri

*"Update on Diagnosis and Treatment of Ocular and Periocular Infections, Including MRSA"*

**October 17**

**Pramod Mistry, M.D.**

Professor of Pediatrics and Internal Medicine, Digestive Diseases, Yale School of Medicine

*"Pathophysiology and Treatment of Fabry Disease"*

**Scott E. Brodie, M.D.**

Associate Professor of Ophthalmology, Mount Sinai School of Medicine

*"Ophthalmic Diagnosis of Fabry Disease"*

**October 24**

**Michael Chiang, M.D.**

Assistant Professor of Ophthalmology and Biomedical Informatics, Columbia University College of Physicians and Surgeons

*"Retinopathy of Prematurity, Imaging, and Telemedicine"*

**October 30**

**Max Forbes, M.D.**

Professor Emeritus of Ophthalmology, Columbia University College of Physicians and Surgeons

*"Inaugural Homer Rees Lecture: Malignant Glaucoma"*

**October 31**

**Max Forbes, M.D.**

Professor Emeritus of Ophthalmology, Columbia University College of Physicians and Surgeons

*"Indention Gonioscopy"*

**November 7**

**Kuldev Singh, M.D.**

Professor of Ophthalmology, Stanford University

*"Randomized Clinical Trials in Glaucoma: What We Have and Have Not Learned"*

**November 14**

**M&B Conference**

**Robert Bernardino, M.D., Host**

**Vincent de Luise, M.D.**

*"Four Vignettes in Cornea and External Disease and Refractive Surgery"*

**November 21**

**Residency Program Update**

**Robert Bernardino, M.D., Host**

**December 5**

**David Parke, M.D.**

Associate Clinical Professor

**Erin Anderson, M.D.**

Clinical Instructor

*"Low Vision"*

**December 12**

**Thomas Samuelson, M.D.**

Clinical Associate Professor of Ophthalmology, University of Minnesota

*"Surgical Glaucoma: Resurrecting the Meshwork? Or ... Not So Much"*

**December 19**

**M&B Conference**

**Robert Bernardino, M.D., Host**

**Town Meeting for All Faculty**

**James C. Tsai, M.D., Host**

**Coming Events**

**April 3**

**Yale Retina Symposium, New York Academy of Medicine**

*"New Frontiers in Retina Diagnosis and Therapy"*

**April 18-19**

**Unite for Sight Conference**

Yale College Campus

**May 28**

**Second Annual Residents Research Day**

**June 19**

**Yale Spring Symposium / Alumni Day**

New Haven Lawn Club

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