

# NEWS AND NOTES

ISSUE 1 WINTER 2010

## LETTER FROM THE CHAIR

DEAR ALUMNI AND FRIENDS:

I'll begin by noting the accomplishments of my extraordinary predecessor, Gregory T. Wolf. In 16 years as chair, Greg's many talents as clinician, educator, and researcher helped lay the foundation for greatness in our department. Now returned to an active clinical and surgical practice,

Greg is director of the National Cancer Institute's Specialized Program of Research Excellence (SPORE) grant to study head and neck cancer. This is one of only five such programs in the United States.

Having completed my first year as chair of Otolaryngology–Head and Neck Surgery, I am grateful to have a chance to reflect on the many achievements made possible by a distinguished and dedicated team of physicians and nurses, researchers, trainees, staff, alumni, and friends. In

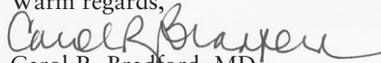
research, we remain unique given the sheer magnitude of our mission relative to the size of our faculty. We are proud to rank second nationwide in NIH funding for Otolaryngology departments, and to remain the top-ranked clinical department in the U-M Health System.

We boast one of the most sought-after residency programs in the country, offering a culture of innovation, a rich clinical experience, and superb medical education. Our clinical divisions have grown in both clinical and surgical service offerings, as well as in outreach and research programs. Last year we saw more than 60,000 patients and performed 5,181 operations in 9,926 hours. Otology/Neurotology has built a national reputation for hearing preservation with removal of acoustic neuromas. Thanks to our Cochlear Implant Program, more than 1,700 children and adults had their hearing restored. Pediatric Otolaryngology now has 6 faculty and its own fellowship, and will soon move to expanded space in the new Women and Children's Hospital. Audiology

and Electrophysiology offers expert routine and specialized services for the detection, diagnosis, and treatment of hearing and related disorders, including intra-operative monitoring and advanced neurophysiologic techniques to preserve facial nerve function. Our Vestibular Testing Center continues to grow as a state-of-the-art facility that provides comprehensive diagnosis and treatment of patients with balance disorders from inner ear dysfunction.

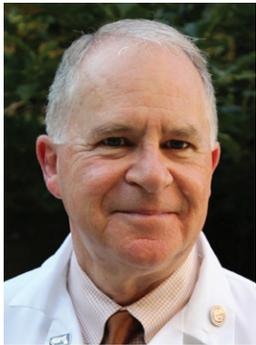
In collaboration with the Comprehensive Cancer Center, our Head and Neck Oncology and Cranial Base Surgery programs have recently been named Destination Programs, with the goal of attracting patients from near and far. Our newest division, Laryngology, Rhinology and General Otolaryngology (LaRGO), treats adult patients in the core subspecialties of laryngology, rhinology, and general otolaryngology. The Vocal Health Center is a leading center for care of the professional voice and the treatment and prevention of voice disorders. Finally, our Facial Plastic and Reconstructive Surgery Center celebrated its 20th anniversary, and continues to provide world-class reconstruction of cancer defects and expert aesthetic surgery.

I heartily invite you to visit or contact us if you would like to learn more about the exciting work going on here or to browse our website at [www.med.umich.edu/oto/](http://www.med.umich.edu/oto/). We have seen much growth and success over the last several decades, and are poised to become the top-ranked program in the nation for education, clinical care, and scientific discovery. Sustainable excellence will require even further investment in our human resources to preserve a culture of engagement, transparency, innovation, and lean thinking. Together we can become the recognized leader in the training of clinicians and scientists; the delivery of exceptional, patient-centered care; and the discoveries that will make a difference in the lives of our patients.

Warm regards,  
  
Carol R. Bradford, MD  
Professor and Chair



## Audiology and Clinical Electrophysiology



Paul Kileny, PhD, Director

In Audiology and Clinical Electrophysiology, we specialize in the detection, diagnosis, and rehabilitation of hearing and related disorders. When I arrived here in 1985, the Audiology division consisted of 4 to 5 staff members who provided basic audiology services. Teaching and research activities were minimal due to busy patient schedules. We now run fully equipped facilities in two Taubman clinics and four satellites, providing routine audiologic assessments, electrophysiologic measurements of auditory and neuromuscular function, and hearing rehabilitation.

Fifteen years ago, our Cochlear Implant program expanded into its own dedicated space at the Briarwood Hearing Rehabilitation Center, directed by Dr. Terry Zwolan. Our staff includes nearly 20 audiologists and speech pathologists. This year our division saw more than 18,000 patients and performed a variety of audiologic tests, as well as many other evaluations for hearing loss, tinnitus, imbalance, or facial dysmotility.

Our audiologists are now providing intraoperative cranial nerve monitoring for two of U-M's Destination programs: the Cutaneous Malignancy Program and the Cranial Base Program. In the past year, our monitoring service has participated in more than 500 OR cases—a fivefold increase in the past 10 years.

Several years ago we received funding for our Early Hearing Loss Detection (EHDL) screening program, which operates seven days per week and captures over 99% of in-house newborns. This program received the very first national "Award for Excellence," presented by the Alexander Graham Bell Association in recognition of our commitment to newborn hearing loss screening, identification, and management.

Our research agenda is rich and varied, and we continuously strive to improve existing diagnostic techniques in collaboration with our colleagues in Otolaryngology, Head and Neck Surgery, Skull Base Surgery, and Pediatric Otolaryngology. Recently, we discovered a new, effective use for an "old" diagnostic tool—electrocochleography (ECoG)—to help diagnose superior semicircular canal dehiscence (SSCD). We have discovered that an elevated SP/AP ratio can assist in the preoperative identification of this condition. Intraoperative ECoG may also be a reliable indicator of a successfully repaired canal dehiscence.

Our audiologists are actively involved in a variety of state and local professional practice organizations. Janynee Handelsman (in the Vestibular Center) has been elected vice president for Audiology Practice for ASHA. Bruce Edwards, assistant director, completed a term on the Board of Governors of the American Board of Audiology. Paul Kileny was nominated for the presidency of the American Academy of Audiology.

## Cochlear Implant Program

The Cochlear Implant Program continues to grow. To date, more than 1,700 children and adults have received a cochlear implant at U-M. The cochlear implant has a profound effect on quality of life, as evidenced by this moving perspective: "My grandfather has a wealth of experience to impart, yet while growing up, I could not have a meaningful conversation with him. He started to lose his hearing at thirty and the disease progressed until he was profoundly deaf. I felt robbed of the education a boy receives through conversations with his grandfather. Over the years, my grandfather researched the progress of an electronic device that led him to the University of Michigan Cochlear Implant Program. I witnessed the process that allowed him to receive two implants from Michigan physicians and researchers. Through the intervention of science and engineering, his life has dramatically changed for the better." In order to reach a broader patient population, we are participating in clinical trials to evaluate the MedEL EAS device in adults, a hybrid cochlear implant that provides sound via electric and acoustic stimulation in the same ear. This device expands current implant criteria and is suitable for adults with a sloping mild to profound hearing loss.

Our pediatric program emphasizes early implantation (12 months of age for children who are born congenitally deaf), and provides and teaches auditory-verbal therapy to facilitate the development of spoken language. Many of the children who receive the implant at a young age demonstrate speech and language skills comparable to those of children with normal hearing and many are enrolled in classrooms with normal hearing peers.

Our Sound Support Program is funded by a cost-shared grant provided by the Department of Otolaryngology and the Michigan Department of Community Health. This funding enables us to provide outreach and training to professionals throughout the state of Michigan, thereby facilitating improved rehabilitation and training for children with hearing loss. In June, we hosted a workshop for teenagers with hearing loss at Ann Arbor's popular teen center, the Neutral Zone. At the all-day event, teens with cochlear implants learned about preparing for college, developing self-advocacy skills, and connecting their implants to iPod, MP3, and Bluetooth technology.

Learn more about U-M's Cochlear Implant Program by visiting our website at [www.med.umich.edu/oto/ci/](http://www.med.umich.edu/oto/ci/).



## Cranial Base Program



Lawrence Marentette, MD, Director

Our program coordinates the treatment of vascular anomalies and facial trauma, and the resection of both benign and malignant tumors involving the cranial base region. In this division, cranial base lesion specialists in Otolaryngology, Neurosurgery, Ophthalmology, Radiation Oncology, and Medical Oncology work together to ensure comprehensive treatment with the highest functioning outcomes. Historically, problems in and around the base of the skull have been considered very difficult, if not impossible, to treat, but thanks to our state-of-the-art

facility, our multidisciplinary approach, our innovative surgical techniques, and our cutting-edge treatment technologies, we are helping our patients to live longer and enjoy a better quality of life.

The cranial base region includes the base of the skull, the facial bones, the fossas or vaults of the skull, and the soft tissues of these regions. Cranial base surgery utilizes a variety of highly specialized surgical techniques and approaches, the most common being the subcranial approach, which involves removing skull base bones to provide access to deeply embedded lesions. This relatively new approach not only affords better access than traditional approaches, but it also prevents retraction of the brain, thus minimizing damage to cranial nerves and vasculature and eliminating the need for extensive rehabilitation. Patients experience little to no facial disfigurement, so return quickly to their preoperative baseline. We are continually researching operative alternatives, such as expanding on endoscopic surgical options for our skull base patients, to even further improve patients' outcomes. We also use radiation therapy, various chemotherapeutic protocols, immunotherapeutic approaches, and, in some cases, a combination of these treatments with or without surgery, to effectively treat cranial base tumors.

The most common lateral cranial base lesion is a tumor called a vestibular schwannoma (acoustic neuroma). Our neurotologists and neurosurgeons use an assortment of surgical techniques, or stereotactic radiotherapy, to obtain optimal outcomes in the management of this type of tumor. Utilizing the middle cranial fossa approach, our team has achieved the highest success rate for hearing preservation reported in the medical literature to date.

Our current research focuses on skull base malignancies such as sinonasal undifferentiated carcinoma, esthesioneuroblastoma, and adenoid cystic carcinoma. A recently published article from our group concludes that patients with esthesioneuroblastoma who are treated with surgical resection followed by radiation therapy have a longer disease-free survival than patients treated with surgery alone. We are currently following over 1,200 skull base patients for continued investigation of treatment modalities and outcomes.



In June I had the great joy of re-joining the Department as Alumni Relations Coordinator—a role I am finding stimulating, challenging, and entirely delightful! I say re-joining since the Department gave me my first position at U-M nearly 15 years ago as a medical secretary, a position I held for 12 years. Coming “home” has been nostalgic, as I know many of our current faculty from their resident years, and I was even

secretary to several! This is a new position for both me and the Department, so the learning curve is steep and we have much catching up to do. That said, this also presents a marvelous opportunity to “grow” both the position and our alumni program—with your help!!

You—our alumni, colleagues, and friends—are so very important to us. If you completed your residency here, you are a source of great pride to the Department; your careers and achievements are first-rate examples of the outstanding patient care, research, and teaching that are critical to our ongoing success. You trained at one of the finest otolaryngology departments in the country, among peers and classmates who share a reputation for excellence. We would love to hear from you and to share the stories of your accomplishments.

I hope to publish a spring/summer and fall/winter newsletter to keep you apprised of departmental activities and achievements, and to invite your participation by including you in social, educational, mentoring, and teaching opportunities. Since your involvement is critical to the Department's success, I hope this newsletter will mark the beginning of a rewarding connection and commitment. I would also like to set up an email group for quick distribution of department news that might be of interest.

Please email me at [spangler@med.umich.edu](mailto:spangler@med.umich.edu) with all your addresses and contact information, as well as your suggestions/ideas for future newsletters and communications. If you have an interesting story, research finding, or viewpoint you'd like to share, I'd be happy to consider it for publication in our next issue! I look forward to working with you!

Warm regards,

Becki Spangler  
Alumni Relations

## Center for Facial Cosmetic Surgery



Shan Baker, MD; Jennifer C. Kim, MD;  
Jeffrey S. Moyer, MD

The Division of Facial Plastic and Reconstructive Surgery is celebrating the 19th anniversary of the Center for Facial Cosmetic Surgery, established in 1990 by Drs. Charles J. Krause and Shan R. Baker, the Center's current director. Dr. Baker has served as chief of the Division

since its inception, and recently published the second edition of his renowned textbook, *Local Flaps in Facial Reconstruction*. He is past president of the American Academy of Facial Plastic and Reconstructive Surgery (AAFPRS), and recent past president of the American Board of Facial Plastic and Reconstructive Surgery (ABFPRS).

The Division provides care for patients in all areas of facial plastic and reconstructive surgery, including reconstruction of the face, reanimation of patients with facial nerve disorders, surgical and non-surgical rejuvenation of the face, and non-rejuvenation cosmetic surgery. An important component of U-M's Skin Cancer Destination Program, the Division performs facial reconstruction surgery of head and neck defects. To date, we have trained 19 fellows in facial plastic surgery, many of whom have contributed significantly to the advancement of facial plastic and reconstructive surgery techniques. Current research projects include facial paralysis and ongoing translational research to develop an implantable electrode for facial reanimation, as well as investigations of outcomes for patients undergoing aesthetic and reconstructive surgery.

We are proud to have our surgeons and other medical personnel donate their skills to the FACE TO FACE program, the humanitarian arm of the AAFPRS devoted to treating victims of domestic violence with facial injuries. Volunteer doctors also travel around the globe to treat children who have been abandoned due to facial deformities caused by birth or trauma.

Located in Livonia, Michigan, the Center for Facial Cosmetic Surgery is comprised of 3 faculty surgeons, a fellow, an aesthetician, 2 nurses, and a medical assistant. Each year, we see nearly 3,000 patients and treat a variety of facial deformities, resulting from infectious disease, cutaneous neoplasms, and congenital anomalies. We perform a wide spectrum of rejuvenative facial surgeries, including facelift, blepharoplasty, endoscopic aesthetic surgery, and deeper laser and chemical facial peels, as well as non-rejuvenative cosmetic surgeries, including rhinoplasty, otoplasty, and scar revision. We also offer laser hair removal and non-invasive facial enhancement using Botox and injectable fillers, and in-office facial skin treatments including chemical peels, microdermabrasion, and micro laser peels. Our staff provides highly personalized service to those seeking facial cosmetic enhancement, and responds with great sensitivity to the emotional and aesthetic needs of patients. For more information, visit the Center's website at: [www.michiganfacialplasticsurgery.com/](http://www.michiganfacialplasticsurgery.com/).

## Division of Head and Neck Oncology



Mark Prince, MD, Chief

The Division of Head and Neck Oncology is thriving. Using organ-sparing techniques and advanced surgical approaches, we are treating a full range of cases. We're also conducting compelling clinical trials, and were recently chosen as one of U-M's Destination programs, demonstrating our regional and national standing in the field.

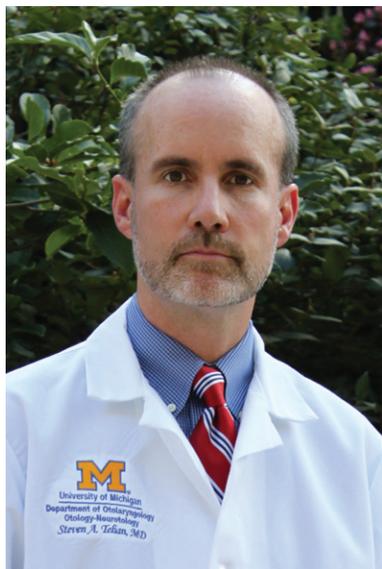
In collaboration with our Division's basic science researchers, Drs. Thomas Carey and Silvana Papagerakis, we are publishing landmark articles in translational, clinical, and basic science research. We are making breakthroughs in seeking the causes and novel treatments of head and neck cancer. We are at the forefront of characterizing the molecular basis of response to radiation and chemotherapy, and now understand human papillomavirus as a prognostic factor in head and neck cancer outcomes. We have refined creative microvascular reconstruction techniques that preserve form and function in our head and neck cancer patients. And with our Comprehensive Cancer Center colleagues, we were the first to discover cancer stem cells in head and neck cancer. We continue to explore the role these critical cells play in the recurrence and spread of cancer.

The faculty members of the Division are also dedicated to resident, medical student, fellow, and undergraduate education. Thanks to Dr. Jeffrey Moyer's leadership efforts as director of Medical Student Education, increasing numbers of outstanding medical students are pursuing otolaryngology residencies, and graduates of our Advanced Head and Neck Oncologic and Reconstructive Surgery fellowship have become leaders in the field.

Members of our Division include Dr. Mark Prince, chief, and Drs. Carol Bradford, Douglas Chepeha, Gregory Wolf, and Jeffrey Moyer. Other critical members of the team include Tammi Miller, Nancy Wallace, Roberta Misko, Marc Haxer, Teresa Lyden, and Margaret Tiner. Dr. Scott McLean recently joined the Division, where he serves patients with a variety of head and neck tumors including skin cancers. A graduate of the Medical College of Ohio and the Mayo Clinic's Otolaryngology-Head and Neck Surgery residency program, Dr. McLean also completed a fellowship at U-M. We're delighted to have him back.

Dr. Gregory Wolf, our former chair, is focused on his new role as director of U-M's Head and Neck Cancer SPORE (Specialized Program of Research Excellence) grant. Among the many ambitious facets of this program is a new and unique clinical trial of preoperative soy isoflavone supplementation to reverse tumor suppressor gene methylation in patients undergoing surgery for head and neck cancer.

## Division of Otology-Neurotology



Steven A. Telian, MD, Division Chief

The Division of Otology-Neurotology continues to provide sophisticated medical and surgical care for patients with disorders of the ear and temporal bone, to offer a first-class education for our trainees, and to make discoveries that benefit our patients.

Dr. Steven A. Telian continues to serve as chief of the Division and medical director of the Cochlear Implant Program, which provides care to more than 1,700 implant recipients. Dr. H. Alexander

Arts remains the director of the Neurotology fellowship, which continues to attract high-caliber applicants, including our current fellow, Dr. Meredith Adams, and incoming fellow, Dr. Gregory Basura. Dr. Hussam K. El-Kashlan remains active as a neurotologist, as medical director of the Vestibular Testing Center, and as director of the department's largest Otolaryngology ambulatory care unit in the Taubman Center. This year, Dr. Katherine (Katie) Heidenreich joined our staff as a medical otologist with a particular interest in vestibular disorders, and Dr. Syed Rizvi is currently devoting two days per week to otologic education and the practice of medical otology.

The division continues to collaborate closely with Neurosurgery's Dr. Greg Thompson, who provides neurosurgical care for our acoustic neuroma and other skull base procedures. Using the middle fossa approach, our group has achieved hearing preservation rates among the world's best, while maintaining high rates of facial nerve function. While we offer observation and stereotactic radiation, many of our acoustic neuroma patients are selecting microsurgical treatment because of these excellent surgical outcomes. In addition, we are now performing surgery on patients who live outside of our geographic region, and we expect this volume to increase with the debut of the Cranial Base Destination Program.

We are particularly proud of the faculty's dedication to our educational activities, which include the Neurotology fellowship, the Otology-Neurotology rotation for Otolaryngology residents, and

the Temporal Bone Surgical Dissection course, which prepares our trainees well for clinical practice and fellowship training.

We continue to collaborate on clinical and research activities with the Division of Audiology. Recently, we identified an important pattern of electrocochleographic findings in people with superior semicircular canal dehiscence (SSCD), leading to improved management of this disorder. Ongoing work with Dr. Tom Carey and other scientists at the Kresge Hearing Research Institute has identified the antigenic target that may be responsible for autoimmune inner ear disease in 60% of patients, and elucidated the structure of that molecule and its position in the cell membrane. We hope to learn more about how it functions in the cells of a healthy inner ear, and to develop a sensitive diagnostic test and improved treatment for autoimmune inner ear disease (AIED).

### Save the Date

#### **AAO-HNS Annual Meeting:**

September 26–29, Boston MA

#### **KHRI 50th Anniversary Symposium:**

October 14–15, Ann Arbor, MI

#### **Michigan Work Society Annual Meeting:**

October 15–17, Ann Arbor, MI

#### **SUO (Society of University Otolaryngologists) Annual Meeting:**

November 12–15, Scottsdale, AZ

## Division of Laryngology, Rhinology and General Otolaryngology (LaRGO)



Norman Hogikyan, MD, Division Chief

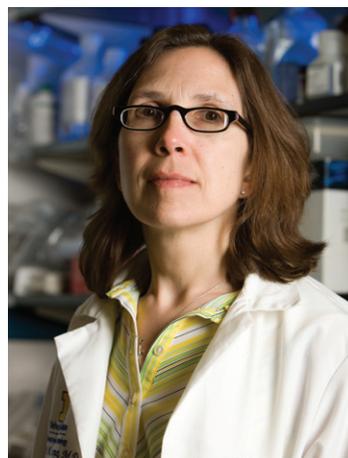
Laryngology, Rhinology and General Otolaryngology (LaRGO) is the newest division in the department, and provides subspecialty care in multiple fields as well as core otolaryngology services. Our faculty are very active in a wide range of endeavors central to our tripartite mission of patient care, education, and research.

Rhinologists Melissa Pynnonen and Jeffery Terrell are studying the use of sustained-release intranasal topical steroids in postoperative rhinology patients. They are also developing a new multidisciplinary clinic for the treatment of patients with aspirin-exacerbated respiratory disease and nasal polyps, commonly called Triad Asthma. Dr. Pynnonen is writing a multidisciplinary NIH grant to use culture-independent molecular-based techniques to aid in the diagnosis of ventilator associated pneumonia. Dr. Terrell, a UMHS leader in the area of information technology (IT), is collaborating with our otologists on making totally digital audiograms for faster and easier storage and delivery. In addition, Dr. Terrell has been awarded a Fostering Innovation Grant (FIG) and is in the final stages of developing an internal YouTube-like website, MTube, that uses a Web 2.0 wiki so that training and educational video content can be shared across the institution.

Dr. Norman Hogikyan, laryngologist, and Marci Rosenberg, soprano and voice therapist, together with leaders of the Ohio Voice Association, recently co-sponsored a conference at U-M entitled Multidisciplinary Care of the Performing Voice. This novel and well-attended conference brought together an international group of voice-related professionals for two days of lectures and workshops. It highlighted the Multidisciplinary Clinic for Occupational and Professional Voice Users at U-M's Vocal Health Center, a unique collaboration between the UMHS and U-M's School of Music, Theatre and Dance. Dr. Hogikyan also received the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) Honor Award at the AAO-HNS annual meeting in October, 2009, for his years of service to the organization and its members.

*Please note that the Department will offer free throat cancer screening in spring of 2010; see [www.med.umich.edu/otollargo/index.htm](http://www.med.umich.edu/otollargo/index.htm) for more information.*

## Pediatric Otolaryngology



Marci Lesperance, MD, Division Chief

Our division now has six specialty-trained otolaryngologists to treat a range of pediatric disorders, with special emphasis on airway problems, pediatric otology and hearing loss, congenital anomalies, infectious diseases, head and neck neoplasms, communication disorders, and paranasal sinus diseases. We can provide complete medical and surgical therapy to infants and children with routine as well as complex and rare diseases and conditions. Under the direction of Marci Lesperance, MD, professor and division chief, the division has

recently established a fellowship in pediatric otolaryngology. We're also hoping to establish an endowed lectureship in pediatric otolaryngology to enhance the education of students, residents, and fellows.

We are collaborating closely with Pediatric Audiology in two programs—Early Detection of Hearing Impairment and Sound Support—concerned with the diagnosis and management of children with hearing disorders. In the Sound Support program, we work with physicians, audiologists, speech pathologists, teachers, and other educational specialists to improve outcomes for children who are deaf or hard of hearing. From when a child is first diagnosed to the ongoing management of his/her condition, we help to coordinate a multi-modal approach and to assist with referrals.

In the Airway Clinic, children with pediatric airway or voice problems are evaluated by an expert team of surgeons, midlevel providers, and speech pathologists. In the past year, a new Genetic Hearing Loss Clinic was established to evaluate patients and families interested in genetic testing or in learning about possible genetic etiologies of their hearing loss. Patients are also offered the opportunity to participate in Dr. Lesperance's research, which focuses on identifying new genes involved in hearing loss. Additional research activity includes Dr. Susan Garetz's work in pediatric obstructive sleep apnea and Dr. Marc Thorne's studies of clinical outcomes in pediatric otolaryngology.

We are looking forward to moving the Division to the state-of-the-art Women and Children's Hospital, when it opens in 2011. With our expanded facilities there, which will include a hearing aid dispensing center and five audiology booths, we can work more easily in multidisciplinary clinics and provide enhanced care to hearing-impaired children.

## Vestibular Testing Center

Our state-of-the-art Vestibular Testing Center (VTC), which is led by William Michael King, PhD (director), Jaynee Handelsman, PhD (assistant director), and Hussam El-Kashlan, MD (medical director), provides a comprehensive assessment of patients with dizziness and balance problems resulting from inner ear dysfunction and other causes. Sophisticated balance function testing evaluates three sensory systems (visual, vestibular, and somatosensory) and the brain's ability to integrate this information. In addition, customized vestibular therapy programs to retrain the brain are proving successful in reducing the symptoms of disequilibrium and dizziness associated with these disorders.

We are proud to have been chosen a hub for the Creating Healthcare Excellence through Education and Research (CHEER) Network's focus on hearing and balance disorders. Funded by the NIDCD, CHEER is a select group of only six collaborative institutions that provides a research infrastructure to facilitate the translation of research into clinical practice. The mission of this project is to become the national resource for practice-based clinical research in hearing and communicative sciences.

We see many pediatric cystic fibrosis (CF) patients who have experienced bilateral vestibular loss secondary to essential aminoglycoside antibiotic therapy. To address the quality of life needs of these patients, we initiated a quality improvement clinical protocol. This investigation has been a major research focus since 2005, and we are honored that the Cystic Fibrosis Foundation has provided funding to support this work. The main goal of this investigation is to determine the prevalence of hearing loss and vestibular system involvement among patients with cystic fibrosis who receive intravenous (IV) aminoglycoside antibiotics. A secondary aim is to determine whether changes in auditory and vestibular function can be detected with subsequent courses of antibiotics. To date, our data suggest a high prevalence of ototoxic damage among patients with CF who are treated with IV aminoglycosides. Furthermore, there is no distinct relationship between changes in hearing status and changes in vestibular function, and our evidence suggests that the ototoxic damage is cumulative. Thus it is clear that a successful program for monitoring the impact of IV aminoglycosides must include evaluation of both hearing and vestibular system function and should provide options for rehabilitative therapy for patients with vestibular loss.



## Benn Gilmore: Renaissance Man

Samuel Johnson (1709–84) once said that “The great source of pleasure is variety,” a statement with which Benn Gilmore, MD (Oto. Res. ’78) would heartily agree. Benn’s maverick spirit has inspired him to “step outside the box,” resulting in a diverse, rewarding career. Benn’s working life began early. From age 15 to 22, he shined shoes to help with family expenses. After completing medical school at U-M in 1970, Benn was selected to pursue a residency under the Berry Plan by the visionary Walter P. Work, former chair of Otolaryngology at U-M. After two years of training, Benn was sent to Japan as a general medical officer, where he delivered babies and performed circumcisions. Upon his return, Benn completed his residency at U-M, and accepted a position as an assistant professor at the Charles R. Drew School of Medicine and Science in Los Angeles. Returning to the Midwest in 1980, he joined the staff at Henry Ford Hospital, where he coordinated the hospital’s residency training program. Eventually Benn established a private practice in the Detroit area, and in 2002, with two partners, he founded the American Laser Centers for hair removal and skin rejuvenation. In 2007, they sold the business, which had grown to 208 centers in 31 states!! His entrepreneurial spirit now in high gear, Benn and a business partner purchased Chrysler Jeep of Ann Arbor in 2008.

In business as in medicine, Benn has always committed himself to treating each employee, vendor, and customer with kindness and respect. Now retired from medical practice (but certainly not idle!), Benn fills his time helping those in need. With his wife and kids, he completes several Christian medical missions each year, having recently ventured to Cuba, New Zealand, South Africa, and Croatia. In his own community, Benn serves meals to the homeless, has “adopted” more than 50 at-risk kids through Detroit’s Adopt-A-Child program, and both sponsors and partners multiple students in Detroit’s innovative Cornerstone Schools. With his wife, he established the Benn and Kathleen Gilmore Foundation, which provides hearing aids, emergency housing, and social services to the elderly. According to Benn, the personal practice ethic and entrepreneurial spirit of Walter Work inspired him to dabble in so many “careers,” while his deep personal faith guided his philanthropy and community service. Benn, congratulations on a dynamic career guided by conscience and compassion, and best wishes for continued joy and adventure in your “retirement!”



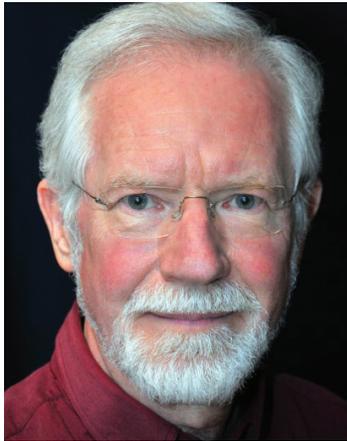
## NOTES ON PHILANTHROPY

The Greek word “philanthropos” (love for mankind) now includes the concept of voluntary giving to improve the human condition. We are grateful for the generous individual, corporate, and institutional support that continues to enable our quest for enhanced education and training and improvements, cures, and breakthroughs for our patients. We’re fortunate to have three endowed professorships. A named professorship is truly an investment in the future, since it creates sustainable support for research, salaries, and expansion of clinical programs. A significant way to honor our esteemed teachers and researchers, it also facilitates our recruitment and retention of leading faculty and researchers as we continue to train the top health care leaders of tomorrow.

- Yehoash Raphael, PhD, is the R. Jamison and Betty J Williams Professor in Otolaryngology. Mr. Jamison enjoyed a distinguished career as an inventor and entrepreneur and held over 20 patents, including for power seats in cars. Dr. Raphael is an internationally regarded scientist whose accomplishments in the areas of hair cell regeneration have opened a new era in hearing restoration research. We are forever indebted to Mr. and Mrs. Jamison for their generous support and confidence in our mission.
- Josef M. Miller, PhD, holds the first Lynn and Ruth Townsend Professorship in Communication Disorders. A president of Chrysler Corporation in 1962 when the company was the comeback story of U.S. business, Lynn Townsend graced the cover of *TIME* magazine in December of that year. Mr. and Mrs. Townsend are U-M alumnae and generous benefactors to the University. Their son is almost completely deaf from an autoimmune hearing loss, inspiring their deep interest in and commitment to hearing research. Dr. Miller is internationally recognized for his research on sudden autoimmune and noise-induced hearing loss.
- The John L. Kemink Professorship in Neurotology honors the memory of a beloved and compassionate clinician and groundbreaking researcher who was slain in 1992. Dr. Kemink was a pioneer in cochlear implantation to restore hearing in deaf children and adults. Steven A. Telian, MD, was appointed to this professorship in 1998. He directs the Division of Otology, Neurotology and Skull Base Surgery, and is medical director of the Cochlear Implant Program. His research interests include new generation cochlear implants, acoustic neuroma treatment outcomes, and vestibular rehabilitation.

The importance of such endowments in maintaining excellence and pursuing greatness cannot be overstated—they are the building blocks of our future.

## Dear Alumni and Friends:



Happy 50th Birthday KHRI!! Yes, it was in 1960 that the Regents of the University of Michigan officially established the Kresge Hearing Research Institute as an independent research unit, which was later integrated into the Department of Otolaryngology. This bit of history leads me to an impor-

tant request: “Please, save the date!” We will celebrate this milestone anniversary with several alumni events and an international symposium on October 14–16, 2010, and hope you will join us. The events on the 16th will be jointly planned with the Michigan Work Society, the alumni group of the clinical department, in order to embrace the many residents and clinical colleagues who have collaborated with KHRI over the years. We will provide more details in due time, but meanwhile, please mark your calendars.

KHRI history reminds me of both enduring traditions and recent changes. Merle Lawrence, our founder and first director, died in 2007 at the age of 92. In 2008, Joe Hawkins, another founding father, passed away at 94. They established a proud tradition of excellence in research and education, and as their students and colleagues, we are privileged to continue our work on their immense shoulders. To honor Merle and Joe, the Merle Lawrence–Joseph Hawkins Lecture Day was established in 2003. Featuring presentations by students, fellows, and residents, this day has become an annual showcase of our rich and varied research, and underlines KHRI’s strong commitment to the education of both researchers and clinicians. A highlight of the day is the Lawrence-Hawkins Lectureship, delivered by a former student or associate of Drs. Lawrence and Hawkins and KHRI. In 2010, the Lawrence-Hawkins Lecture Day will be held in conjunction with our 50th anniversary celebration.

On a lighter note, recent KHRI graduates will be glad to learn that our renowned holiday potlucks, as well as our annual canoe trip and picnic, are alive and thriving. So come and join us again someday!

Since this is our first communication in a long time, I would like to briefly update you on KHRI faculty and research projects (see pages 10–12 for detailed descriptions of our laboratories and their research programs and

our website: [www.khri.med.umich.edu](http://www.khri.med.umich.edu)). Currently, our staff includes fourteen faculty and, one active emerita, all of whom are engaged in research ranging from the study of molecular events at the cellular level to investigations at the system levels and on to translational research and clinical trials.

Despite the financial constraints of the National Institutes of Health (NIH), our research budget has grown steadily over the years. In addition to receiving NIH support for individual laboratories, KHRI now holds several major overarching grants, including a training grant for students and postdoctoral fellows (T32), a center grant for hearing research core services (P30), a program project grant on age-related hearing loss (P01), and a cooperative research grant for clinical trials (U01). We are proud that our department ranks second in the nation for NIH funding for Otolaryngology departments. In addition, our faculty has received much recognition for their professional accomplishments, ranging from speaking invitations at international conferences to national and international awards to media reports highlighting their achievements. Recently, our commitment to the training of deaf and hard-of-hearing students was recognized with the Distinguished Diversity Leaders Award of the University of Michigan (see our website to learn more).

With a touch of nostalgia, I report that the original Kresge Hearing Research building is no longer in use. In the spring of 2008, our laboratories moved to newly renovated quarters in the Medical Sciences I building, located near the Cancer Center research groups and the otolaryngology clinic in the Taubman Center. The old building is still standing, and we hope to salvage a few bricks as memorabilia when it gets torn down later in 2010.

In closing, KHRI is indeed flourishing. Our research and educational endeavors have increased tremendously over the decades, and we look forward to the next decades under the new departmental leadership of Dr. Carol Bradford. We are making solid progress toward our goal of advancing scientific knowledge of the development, function, and pathology of hearing and balance. We remain in the forefront, translating today’s scientific discoveries into tomorrow’s clinical treatments, and providing first-class training to future generations of scientists and clinician-scientists worldwide.

Best wishes to all of you,

  
Jochen Schacht, PhD  
Professor and Director

Upcoming newsletters will feature brief overviews, as well as occasional detailed reports, of the research activities of the KHRI laboratories. Here are some of the latest findings:

**Thomas Carey, PhD**  
**Cell Biology and Immunology**  
**Laboratory**



Our lab is investigating the role of antibody-induced deafness in Autoimmune Hearing Loss (AHL) and in experimental laboratory models. We have discovered that a monoclonal antibody raised to isolated inner ear cells can bind to inner ear supporting cells *in vivo* and that subsequently the animal loses auditory hair cells and develops hearing loss. Studies of patients with the clinical diagnosis of AHL also frequently have circulating antibodies that bind to inner ear supporting cells with the same pattern as the monoclonal antibody. These patients are also three times more likely to respond to treatment with immunosuppressive corticosteroids than are patients who lack such antibodies. This suggests that the antibody may be the cause of the hearing impairment and that some patients with antibody-mediated hearing loss can recover hearing when the antibodies are suppressed with immunosuppressive treatment. To understand the basis of these observations, we isolated and sequenced the target inner ear protein and identified it. This protein is called CTL2/SLC44A2 for choline transporter-like protein/solute carrier protein 44A2. We have expressed the protein in insect cells and we are developing an assay to detect circulating antibodies to this protein as a potential diagnostic aid in evaluating patients who may have antibody-mediated inner ear disease. We are also designing experiments to determine the transporter function of the protein and why it is required for normal homeostasis of the inner ear and survival of auditory sensory cells.

**W. Michael King, PhD**  
**Vestibular and Oculomotor**  
**Laboratory**



Our lab is developing novel ways to test vestibular and balance function in small mammals, such as guinea pigs and mice. In addition to performing measurements of reflexive eye movements produced by head motion (vestibulo-ocular reflex or VOR), we measure the less commonly studied vestibular reflexes that stabilize and orient the head in space. We are using our new tests to assess vestibular function in guinea pigs exposed to aminoglycoside antibiotics as part of a translational study to develop and evaluate agents that may reduce the ototoxicity of these valuable antibiotics.

Currently, we are developing a test to assess diminished vestibular function in relation to an individual's propensity to fall, a significant problem for the elderly. We are employing a novel model that makes use of a miniature inertial sensor to study the relationship between head orientation and balance as a mouse traverses a narrow beam. Our long-term goal is to translate our findings to the clinical environment by developing new test strategies for the diagnosis of vestibular disorders and new oto-protective or rehabilitative strategies for patients with balance disorders.

**Margaret I. Lomax, PhD**  
**Molecular Biology Laboratory**



Over the last 16 years, the Molecular Biology Laboratory has used modern molecular biology and molecular genetics approaches to study the development and regeneration of the auditory system in the chick, and the inner ear's response to noise trauma in

both chicks and mammals. A recent focus is the molecular response of the mature mammalian auditory system to noise overstimulation using DNA microarray technology. Understanding which genes are activated after acoustic trauma should enable investigators to identify the physiological processes or homeostatic mechanisms involved in the protective response to acoustic trauma in mammals, as well as those pathways that lead to irreversible cell death and permanent deafness. Our current research looks at the role protective heat shock response plays in young mice exposed to noise overstimulation and also at the effect of eliminating this pathway in age-related hearing loss. To study age-related hearing loss, we age mouse Hsf1 knockout mice and evaluate ABR thresholds at increasing age to investigate the role of the protective heat shock response as mice age. Although I officially retired at the end of 2008, I will continue to direct the molecular biology lab until the aging program project grant is completed and data are published.

**Josef M. Miller, PhD**  
**Brian, Alice and Charles Manoogian**  
**Laboratory for Cochlear Signaling and**  
**Inner Ear Regenerative Medicine**

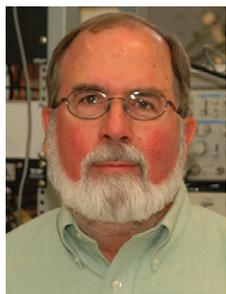


Led by Josef M. Miller, the laboratory is focusing on: (1) the prevention of auditory nerve degeneration following deafferentation, the regrowth of the nerve, and the replacement of the nerve using endogenous and exogenous stem cells and (2) the mechanisms underlying, and the prevention of, noise-induced hearing loss. Working with Richard Altschuler, Yehoash Raphael, Dave Dolan, and Mats Ulfendahl, Dr. Miller has shown the following: endogenous stem cells exist in the organ of Corti and Rosenthal's canals, which can be upregulated with stress; and these cells survive, differentiate into a neuronal phenotype, grow neuritis toward the central auditory pathways, and show spiral ganglion-like characteristics.

Dr. Miller's work has revealed that the production of free radicals and related blood flow reduction are key factors in the development

of noise-induced hearing loss and that the administration of selected antioxidants in combination with vasodilators could dramatically reduce noise-induced hearing loss. Because of these findings, the NIH chose to fund a multicenter-international trial on preventing noise-induced hearing loss. The trial is currently looking at: weapon-fire-induced hearing loss (Swedish military), hearing loss from iPod use (U.S. students), machine-noise-induced loss (mechanics in Spain), and industrial-noise-induced loss (stamping factory in Spain).

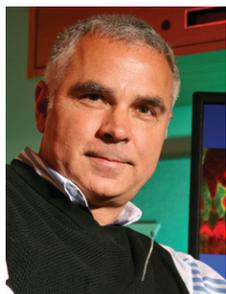
**Bryan Pfingst, PhD**  
**Auditory Prosthesis Perception and Psychophysics Laboratory**



Our laboratory is collaborating with Dr. Yehoash Raphael's Otopathology Laboratory and with the department's Hearing Rehabilitation Center (headed by Dr. Terry Zwolan) on research aimed at improving

the hearing of patients with cochlear implants. Work with the Raphael laboratory involves the use of gene therapy to preserve or restore the neural substrate that is necessary for optimal cochlear implant function. Research on psychophysical and speech recognition, conducted in the Pfingst laboratory with Dr. Zwolan, involves identifying individual stimulation sites within a patient's implant where performance is weak, due primarily to localized otopathology, and identifying clinically applicable procedures that will improve speech recognition.

**Yehoash Raphael, PhD**  
**Otopathology Laboratory**



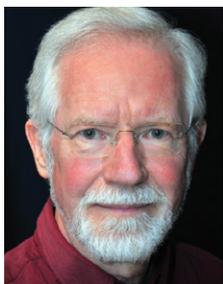
The lab is working on developing novel technologies that can help prevent and cure inner ear disease. Specifically, researchers are examining the possibility of using gene transfer to prevent hearing loss and promote hair cell regeneration. Our goal is to

accomplish gene transfer via clinically applicable routes such as trans-tympanic injection. One possible method for inducing hair cell regeneration in deaf ears involves forcing supporting cells to transdifferentiate and become new hair cells. We have demonstrated the possibility of transdifferentiation using viral mediated transgene expression, and are now pursuing non-viral methods.

Deaf ears that are devoid of hair cells typically lack auditory nerve dendrites, even if cell bodies in Rosenthal's canal survive. We are developing novel methods for inducing growth of nerve endings back into the area of the (deaf) organ of Corti. This nerve regeneration is potentially capable of improving stimulation parameters and psychophysical responses directly, as well as of enhancing preservation of spiral ganglion neurons and their central connections.

We have been developing models for balance disorders by inducing experimental lesions in the vestibular epithelia of mice and guinea pigs. We are now testing protection against loss of hair cells, in partnership with Mike King and Jochen Schacht. Working with geneticists on campus, we are characterizing hereditary deafness and balance mutations and determining the role of the associated gene products in ear development and function.

**Jochen Schacht, PhD**  
**Auditory Biochemistry and Molecular Biology Laboratory**



It seems hard to believe but we are the oldest lab in KHRI, having started in 1972. We continue to focus on biochemical and molecular signaling pathways in auditory processing and disorders.

We are now concentrating on aminoglycoside-induced and age-related hearing loss in collaboration with our colleague Dr. Su-Hua Sha. Our discovery in animal models that simple antioxidants can prevent these side effects led to a clinical trial in collaboration with colleagues at the Fourth Military Medical Academy in Xi'an, China. By administering

aspirin to patients receiving gentamicin, we were able to reduce the incidence of hearing loss by 75%. We are continuing our quest for a thorough understanding of the molecular pathology of hearing loss and for even better protection.

In addition, we are working with Dr. Eric Böttger's group in Switzerland to synthesize aminoglycoside derivatives that have similarly powerful and broad-spectrum antibacterial activity but are devoid of ototoxic side effects. Another and rather novel application of aminoglycosides is the treatment of genetic diseases caused by mutations that introduce premature stop codons, truncating essential proteins. We are collaborating with Dr. Timor Baasov's group in Israel on non-toxic "designer aminoglycosides" that promote an override of these stop codons and thus allow for the synthesis of functional proteins.

**Su-Hua Sha, MD**  
**Molecular Otology and Signal Transduction Laboratory**



Today noise-induced hearing loss is a major and increasing problem in industrialized countries stemming from both workplace and leisure activities. While most people are aware of the dangers of factory and

machinery noises, gunshots, and aircraft noise, many disregard the dangers techno and disco music, and iPods playing at high volume, pose to their hearing. Tinnitus, temporary elevation in hearing threshold, and permanent hearing loss are all possible consequences.

Currently we are focused on two areas of research: (1) the initial events following noise exposure, which may involve the enhanced formation of reactive oxygen species and therefore upset the redox balance of the cell, and (2) the resulting signaling pathways, their transcription factors, and the eventual effects on gene expression. The animal model of choice is the mouse, which is being exposed to various levels of noise. However, on the basis

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of our in-vivo results, we have also begun to establish an in-vitro model, enabling us to more effectively elucidate the pathways that follow the initial responses to noise trauma.

**Susan Shore, PhD**  
Sensory Neurobiology Laboratory



Our lab is primarily focused on investigating the neural mechanisms underlying tinnitus and hyperacusis. Tinnitus is a major disorder that affects up to 30% of the population and is

debilitating for at least 12% of the population. Hyperacusis, or the inability to tolerate loud sounds, often accompanies tinnitus. Our

studies investigate changes in the auditory part of the brain after hearing loss, which become overactive after hearing loss and lead to tinnitus. In addition, we have discovered pathways from other brain areas, such as the somatosensory system, which appear to play a major role in the development of, and modulation of, this disturbing condition. We have recently shown that these pathways become overactive after hearing loss and may be partly responsible for the hyperactivity occurring in one of the auditory centers of the brain, the cochlear nucleus. From our discoveries of these neural connections and their neurotransmitters have emerged therapies to eliminate tinnitus. These therapies target the specific neurotransmitters and the actions of the pathways, shown to cause elevated activity in brain regions associated with tinnitus.

Treatments involve pharmacological interventions that are based on our discoveries:

specifically, pharmacological blocking agents to slow down the firing of nerves that cause tinnitus, stimulation of somatosensory pathways through acupuncture, and stimulation of somatosensory pathways through trigger point therapies.

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Thank you very much for all you are doing to make our work possible.