Otolaryngology

Division Photo

Front Row: R Elluru, R Cotton, C Myer III; Second Row:JP Willging, J Greinwald Jr, E Arjmand;
Not pictured: M Rutter, S Shott, D Brown, S Riazuddin

Division Data Summary

Research and Training Details

Number of Faculty	12
Number of Joint Appointment Faculty	2
Number of Support Personnel	54
Direct Annual Grant Support	$242,940
Direct Annual Industry Support	$12,551
Peer Reviewed Publications	34

Clinical Activities and Training

Number of Clinical Fellows	6
Number of Other Students	1
Inpatient Encounters	542
Outpatient Encounters	45,873

Significant Publications

Meinzen-Derr, J., L. H. Lim, Choo, DI, et al. (2008). "Pediatric hearing impairment caregiver experience: impact of duration of hearing loss on parental stress." Int J Pediatr Otorhinolaryngol 72(11): 1693-703.

Parental stressors change over time with respect to the time of diagnosis of hearing impairment. This phenomenon was observed irrespective of the age of diagnosis of hearing loss. As professionals serving families of children with hearing loss, we should be aware of changing stressors over time and identify the appropriate support services for families to meet those changing needs. By addressing those evolving stressors, the families' ability to support and improve the outcomes for their children who are deaf or hard of hearing may be enhanced.

Elluru, R. G., F. Thompson, et al. (2009). "Fibroblast growth factor 18 gives growth and directional cues to airway cartilage." Laryngoscope 119(6): 1153-65.

FGF18 provided both directional and proliferative cues to chondrocytes in the developing upper respiratory tract. FGF18 exerted this effect on developing chondrocytes by up-regulating Sox9 expression.

Wiley, S., J. Meinzen-Derr, Choo D. (2008). "Auditory skills development among children with developmental delays and cochlear implants." Ann Otol Rhinol Laryngol 117(10): 711-8.

Children with additional disabilities make progress in auditory skills, but may not develop higher auditory skills of identification and comprehension within the first 6 months after implantation. Categorizing children according to a cognitive developmental quotient may provide more predictive ability than does categorizing them by disability type.

Division Highlights

Saima Riazuddin

During FY09, Dr. Riazuddin characterized a nonsyndromic deafness gene known as BSND. BSND has been reported as a disease gene for a severe variant of barter syndrome that combines renal salt loss with sensorineural deafness. In this study we have shown the functional consequeces of p.I12T differ from BSND mutations that cause renal failure and deafness in Bartter syndrome.

Ravi Elluru

Dr. Ravi Elluru earned high honors from The Triological Society with the Edmund Prince Fowler Award. This award was given to him for his thesis “Fibroblast Growth Factor 18 Provides Directional and Proliferative Cues to Developing Upper Respiratory Tract Cartilage. Revered as one of the most prestigious awards, Edmund Prince Fowler, Sr., MD, was the president of The Triological Society in 1932. He was considered a giant in otology and was an advocate for the hard of hearing. In his honor, the Edmund Fowler Award was established in 1971, given each year for the best in thesis research. Dr. Elluru was inducted into The Triological Society as an Active Fellow in May 2009 at The Triological Society's 112th Annual COSM Meeting in Phoenix.

Division Collaboration

Collaboration with Pediatric Radiology

Collaborating Faculty: Scott Holland, PhD

Working on NIH funded study (RO1-DC07186) using fMRI to predict outcome from cochlear implants in infants.

Collaboration with Bioinformatics

Collaborating Faculty: Bruce Aronow, PhD

Working to validate a diagnostic micro-array gene chip for detection of genetic causes of pediatric hearing loss.

Collaboration with Speech Pathology

Collaborating Faculty: Lisa Kelchner, Barbara Weinrich, Susan Brehm

Collaborative effort to analyze outcomes of pediatric voice following laryngotracheal reconstruction.

Faculty Members

Robin T. Cotton, MD, Professor ; *Director, Department of Pediatric Otolaryngology; Director, Aerodigestive and Sleep Center; ;*

Ellis M. Arjmand, MD, PhD, Associate Professor ; *Director, Ear and Hearing Center*

David K. Brown, PhD, Assistant Professor ; *Director, Audiological Research Lab*

Daniel I. Choo, MD, Associate Professor

Alessandro deAlarcon, MD, Assistant Professor ; *Director, Voice Clinic*

Ravindhra G. Elluru, MD, PhD, Assistant Professor

John. H. Greinwald Jr., MD, Associate Professor

Charles M. Myer III, MD, Professor ; *Director, Pediatric Otolaryngology Residency Program*

Saima Riazuddin, PhD, Assistant Professor ; *Director, Laboratory of Molecular Genetics*

Michael J. Rutter, MD, Associate Professor

Sally R. Shott, MD, Professor

J. Paul Willging, MD, Professor ; *Director, Pediatric Otolaryngology Fellowship Program*

Joint Appointment Faculty Members

Zubair Ahmed, PhD, Assistant Professor
Opthalmology
Genetics

Jareen Meinzen-Derr, MPH, PhD, Assistant Professor
Biostatistics & Epidemiology
Epidemiology

Trainees

- **Jeremy Prager, MD,** PGY-VI, Washington University School of Medicine (St. Louis)
- **Evan Propst, MD, MSc, FRCSC ,** PGY-VI, University of Toronto
- **Marlene Soma, BSc(Med) MBBS, FRACS,** PGY-VI, University of New South Wales
- **Matthew Bromwich, MD, FRCS(c),** PGY-VII, Queen's University School of Medicine (Kingston, Canada)
- **J. Matthew Dickson, MD, FRCS(c),** PGY-VII, University of British Columbia (Vancouver, Canada)
- **Christopher Wootten, MD,** PGY-VII, Baylor College of Medicine

Significant Accomplishments

Cincinnati Children's Hearing Aid Trust (CCHAT)

The Cincinnati Children's Hearing Aid Trust's vision is to offer the gift of hearing to as many Ohio children as possible. The primary goal is to provide Ohio children, from birth to age three, with their first set of hearing aids for free. CCHAT has partnered with the Ohio Department of Health (ODH), the Bureau of Early Intervention Services (BEIS), the Bureau for Children with Medical Handicaps (BCMH), the Regional Infant Hearing Programs (RIHP), Phonak and Oticon, as well as individual sponsors, to make this goal come to life and start helping hundreds of children. Early hearing intervention in children with confirmed hearing loss is critical, yet the financial challenges associated with obtaining hearing aids can be burdensome. CCHAT and its partners are devoted to helping families overcome obstacles and alleviate the stressors associated with hearing loss.

Laboratory of Molecular Genetics

The division of Pediatric Otolaryngology successfully recruited Dr. Saima Riazzudin to direct the Pediatric Otolaryngology Laboratory of Molecular Genetics. Dr. Riazuddin is a well-published, rising star in the field. Her research has largely focused on the identification and characterization of human genetic mutations that cause hereditary hearing loss. Her research will continue to identify novel genes related to deafness as well as examine the function of these genes at a cellular and organ level.

Given our departmental emphasis on hearing and deafness as well as the departmental mission to advance the understanding and management of hearing disorders, Dr. Riazzudin's research on the molecular basis for hereditary hearing loss presents a very congruous program to bring into Otolaryngology. The long term benefits to the Department of Otolaryngology will be to establish a robust and self-sustaining research program that will be extremely competitive for extramural funding and establish our department as a scientific center for excellence to compliment our existing clinical centers of excellence.

Communication Sciences Research Center (CSRC)

The Communication Sciences Research Center (CSRC), a collaborative research program involving Pediatric Otolaryngology, Audiology, and Speech-Language Pathology, was established in 2009. The program will be directed by Scott Holland, PhD, McLaurin Scholar and Professor of Radiology. The CSRC is designed to promote interdisciplinary research into the causes and treatment of communicative disorders in children, and to integrate and coordinate the research activities of faculty members in the participating divisions. Building on a strong foundation of clinical and laboratory research in Otolaryngology, Audiology, and Speech-Language Pathology, two additional faculty members in the fields of hearing science and speech/voice science are being recruited.

Division Publications

1. Anwar S, Riazuddin S, Ahmed ZM, Tasneem S, Ateeq Ul J, Khan SY, Griffith AJ, Friedman TB. SLC26A4 mutation

spectrum associated with DFNB4 deafness and Pendred's syndrome in Pakistanis. *J Hum Genet.* 2009; 54: 266-70.

2. Kotecha R, Pardos M, Wang Y, Wu T, Horn P, Brown D, Rose D, deGrauw T, Xiang J. Modeling the developmental patterns of auditory evoked magnetic fields in children. *PLoS One.* 2009; 4: e4811.
3. Kothiyal P, Cox S, Ebert J, Aronow BJ, Greinwald JH, Rehm HL. An overview of custom array sequencing. *Curr Protoc Hum Genet.* 2009; Chapter 7: Unit 7 17.
4. Miller CK, Linck J, Willging JP. Duration and extent of dysphagia following pediatric airway reconstruction. *Int J Pediatr Otorhinolaryngol.* 2009; 73: 573-9.
5. Richter GT, Wootten CT, Rutter MJ, Thompson DM. Impact of supraglottoplasty on aspiration in severe laryngomalacia. *Ann Otol Rhinol Laryngol.* 2009; 118: 259-66.
6. Wootten CT, Rutter MJ, Dickson JM, Samuels PJ. Anesthetic management of patients with tracheal T-tubes. *Paediatr Anaesth.* 2009; 19: 349-57.
7. Eivazi B, Ardelean M, Baumler W, Berlien HP, Cremer H, Elluru R, Koltai P, Olofsson J, Richter G, Schick B, Werner JA. Update on hemangiomas and vascular malformations of the head and neck. *Eur Arch Otorhinolaryngol.* 2009; 266: 187-97.
8. Bardien S, Human H, Harris T, Hefke G, Veikondis R, Schaaf HS, van der Merwe L, Greinwald JH, Fagan J, de Jong G. A rapid method for detection of five known mutations associated with aminoglycoside-induced deafness. *BMC Med Genet.* 2009; 10: 2.
9. Dickson JM, Richter GT, Meinzen-Derr J, Rutter MJ, Thompson DM. Secondary airway lesions in infants with laryngomalacia. *Ann Otol Rhinol Laryngol.* 2009; 118: 37-43.
10. Hall JE, Richter GT, Choo DI. Surgical management of otologic disease in pediatric patients with Turner syndrome. *Int J Pediatr Otorhinolaryngol.* 2009; 73: 57-65.
11. Mihaescu M, Gutmark E, Murugappan S, Elluru R, Cohen A, Willging JP. Modeling flow in a compromised pediatric airway breathing air and heliox. *Laryngoscope.* 2009; 119: 145-51.
12. Richter GT, Mehta D, Albert D, Elluru RG. A novel murine model for the examination of experimental subglottic stenosis. *Arch Otolaryngol Head Neck Surg.* 2009; 135: 45-52.
13. Saunders JE, Greinwald JH, Vaz S, Guo Y. Aminoglycoside ototoxicity in Nicaraguan children: patient risk factors and mitochondrial DNA results. *Otolaryngol Head Neck Surg.* 2009; 140: 103-7.
14. Burrow TA, Saal HM, de Alarcon A, Martin LJ, Cotton RT, Hopkin RJ. Characterization of congenital anomalies in individuals with choanal atresia. *Arch Otolaryngol Head Neck Surg.* 2009; 135: 543-7.
15. Elluru RG, Thompson F, Reece A. Fibroblast growth factor 18 gives growth and directional cues to airway cartilage. *Laryngoscope.* 2009; 119: 1153-65.
16. Wootten CT, Goudy SL, Rutter MJ, Willging JP, Cotton RT. Airway injury complicating excision of thyroglossal duct cysts. *Int J Pediatr Otorhinolaryngol.* 2009; 73: 797-801.
17. Choi BY, Ahmed ZM, Riazuddin S, Bhinder MA, Shahzad M, Husnain T, Griffith AJ, Friedman TB. Identities and frequencies of mutations of the otoferlin gene (OTOF) causing DFNB9 deafness in Pakistan. *Clin Genet.* 2009; 75: 237-43.
18. Lee KH, Larson DA, Shott G, Rasmussen B, Cohen AP, Benton C, Halsted M, Choo D, Meinzen-Derr J, Greinwald JH, Jr.. Audiologic and temporal bone imaging findings in patients with sensorineural hearing loss and GJB2 mutations. *Laryngoscope.* 2009; 119: 554-8.
19. Statham MM, Vohra A, Mehta DK, Baker T, Sarlay R, Rutter MJ. Serratia marcescens causing cervical necrotizing oropharyngitis. *Int J Pediatr Otorhinolaryngol.* 2009; 73: 467-73.
20. Hart CK, Richter GT, Cotton RT, Rutter MJ. Arytenoid prolapse: a source of obstruction following laryngotracheoplasty. *Otolaryngol Head Neck Surg.* 2009; 140: 752-6.
21. White DR, Bravo M, Vijayasekaran S, Rutter MJ, Cotton RT, Elluru RG. Laryngotracheoplasty as an alternative to tracheotomy in infants younger than 6 months. *Arch Otolaryngol Head Neck Surg.* 2009; 135: 445-7.
22. Ahmed ZM, Kjellstrom S, Haywood-Watson RJ, Bush RA, Hampton LL, Battey JF, Riazuddin S, Frolenkov G, Sieving PA, Friedman TB. Double homozygous waltzer and Ames waltzer mice provide no evidence of retinal degeneration. *Mol Vis.* 2008; 14: 2227-36.
23. Mihaescu M, Gutmark E, Murugappan S, Elluru R, Cohen A, Willging JP. Modeling flow in a compromised pediatric airway breathing air and heliox. *Laryngoscope.* 2008; 118: 2205-11.
24. Rutter MJ, Cohen AP, de Alarcon A. Endoscopic airway management in children. *Curr Opin Otolaryngol Head Neck Surg.* 2008; 16: 525-9.
25. Statham MM, Mehta D, Willging JP. Cervical thymic remnants in children. *Int J Pediatr Otorhinolaryngol.* 2008; 72: 1807-13.

26. Sie KC, Starr JR, Bloom DC, Cunningham M, de Serres LM, Drake AF, Elluru RG, Haddad J, Jr., Hartnick C, Macarthur C, Milczuk HA, Muntz HR, Perkins JA, Senders C, Smith ME, Tollefson T, Willging JP, Zdanski CJ. Multicenter interrater and intrarater reliability in the endoscopic evaluation of velopharyngeal insufficiency. *Arch Otolaryngol Head Neck Surg.* 2008; 134: 757-63.
27. Ahmed ZM, Masmoudi S, Kalay E, Belyantseva IA, Mosrati MA, Collin RW, Riazuddin S, Hmani-Aifa M, Venselaar H, Kawar MN, Tlili A, van der Zwaag B, Khan SY, Ayadi L, Riazuddin SA, Morell RJ, Griffith AJ, Charfedine I, Caylan R, Oostrik J, Karaguzel A, Ghorbel A, Friedman TB, Ayadi H, Kremer H. Mutations of LRTOMT, a fusion gene with alternative reading frames, cause nonsyndromic deafness in humans. *Nat Genet.* 2008; 40: 1335-40.
28. Meinzen-Derr J, Lim LH, Choo DI, Buyniski S, Wiley S. Pediatric hearing impairment caregiver experience: impact of duration of hearing loss on parental stress. *Int J Pediatr Otorhinolaryngol.* 2008; 72: 1693-703.
29. Ahmed ZM, Riazuddin S, Aye S, Ali RA, Venselaar H, Anwar S, Belyantseva PP, Qasim M, Friedman TB. Gene structure and mutant alleles of PCDH15: nonsyndromic deafness DFNB23 and type 1 Usher syndrome. *Hum Genet.* 2008; 124: 215-23.
30. de Alarcon A, Rutter MJ. Revision pediatric laryngotracheal reconstruction. *Otolaryngol Clin North Am.* 2008; 41: 959-80, x.
31. Guimaraes CV, Donnelly LF, Shott SR, Amin RS, Kalra M. Relative rather than absolute macroglossia in patients with Down syndrome: implications for treatment of obstructive sleep apnea. *Pediatr Radiol.* 2008; 38: 1062-7.
32. Hearst MJ, Kadar A, Keller JT, Choo DI, Pensak ML, Samy RN. Petrous carotid canal dehiscence: an anatomic and radiographic study. *Otol Neurotol.* 2008; 29: 1001-4.
33. Koempel JA, Cotton RT. History of pediatric laryngotracheal reconstruction. *Otolaryngol Clin North Am.* 2008; 41: 825-35, vii.
34. Wiley S, Meinzen-Derr J, Choo D. Auditory skills development among children with developmental delays and cochlear implants. *Ann Otol Rhinol Laryngol.* 2008; 117: 711-8.

Grants, Contracts, and Industry Agreements

Grant and Contract Awards — Annual Direct / Project Period Direct

CHOO, D

A Preclinical Trail of Intratympanic Antivirals for CMV
National Institutes of Health
R01 DC 008651 — 01/01/07 - 12/31/11 — $242,940 / $1,230,455

Current Year Direct **$242,940**

Industry Contracts

Greinwald, J
Cochlear Americas — $ 12,551

Current Year Direct Receipts **$ 12,551**

Total $ 255,491