

CURRICULUM VITAE

PART I: General Information

DATE PREPARED: 9/25/03

Name: Douglas Allen Cotanche

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FAX: 617-247-5288

Education:

1977	B.A.	University of New Hampshire (Zoology, Theatre)
1983	Ph.D.	University of North Carolina at Chapel Hill (Anatomy)

Postdoctoral Training:

1983-1985	NIH Postdoctoral Fellow	Cell Biology	University of Pennsylvania
1984 (Summer)	Postdoctoral student	Cell and Molecular Biology	Marine Biological Laboratory Woods Hole, MA

Licensure and Certification: none

Academic Appointments:

1985-1987	Assistant Professor, Medical University of South Carolina.
1987-1993	Assistant Professor, Boston University School of Medicine
1993-1997	Associate Professor, Boston University School of Medicine
1998-	Adjunct Associate Professor, Boston University School of Medicine
1998-	Associate Professor, Harvard Medical School

Hospital or Affiliated Institution Appointments:

1996-	Research Associate, Department of Otolaryngology, Children's Hospital
1998-	Director of Research, Department of Otolaryngology, Children's Hospital
	Faculty Affiliate, Program in Neuroscience, Harvard Medical School
	Faculty Affiliate, Mental Retardation Research Center, Department of Neurology, TCH
	Faculty Member, Speech and Hearing Biosciences and Technology Program
1999-	Founding Member, Harvard Medical School Center for Hereditary Deafness
2002-	Member, Harvard Center for Neurodegeneration and Repair

Other Professional Positions and Major Visiting Appointments: none

Hospital and Health Care Organization Service Responsibilities: none

Major Administrative Responsibilities: none

Major Committee Assignments:

Children's Hospital, Harvard Medical School

- 1998- Pediatric Otolaryngology Fellowship Admissions Committee
- 1998- Children's Hospital Research Faculty Council
- 1999- Department of Otolaryngology Research Committee (chair)
- 1999-2001 Children's Hospital Research Computing Steering Committee
- 2000- Neurotologist Faculty Search Committee, Department of Otology & Laryngology
Massachusetts Eye & Ear Infirmary, Harvard Medical School
- 2001-2004 Children's Hospital IACUC Committee
- 2001- Children's Hospital Research Faculty Council Education Committee
- 2001- Department of Otolaryngology IRB Review Committee (chair)
- 2002- Children's Hospital Surgical Research Committee

Boston University School of Medicine:

- 1990-1995 Academic Advisor to Medical Students
- 1991 New Faculty Search Committee, Department of Anatomy & Neurobiology
- 1991-1997 Co-Coordinator of BUSM Confocal Laser Scanning Microscope Core Facility
- 1993-1995 Steering Committee, Interdepartmental Neuroscience Program
- 1994-1997 Executive Committee- Molecular & Cellular Biology Program
- 1996-1997 Admissions Committee- Molecular & Cellular Biology Program
- 1996-1997 Advisory Committee, MD-PhD Program

National:

- 1985-1998 Chairman, Poster Session Committee, ARO Midwinter Meeting
- 1985 Outside Reviewer, Hearing Research Study Section- NIH DRG
- 1985-1987 Ad hoc Reviewer, Developmental Neurosciences Panel- NSF
- 1986-1988 Reviewer of Abstracts submitted for ARO Midwinter Meeting
- 1988 Reviewer, Innovative Research Fund, N.C. Technological Development Authority
- 1989-1990 Ad hoc Grant Reviewer, Neuroscience Program- NSF
- 1990-1993 Advisory Committee of Young Anatomists, American Association of Anatomists
- 1991-1993 Chairman, Jan Langman Graduate Student Awards Presentations, American Association of Anatomists
- 1992 Ad hoc Member, Sensory Disorders & Language Study Section, NIH
- 1991-1993 Grant Reviewer, VA Medical Research Service- Neurobiology Merit Review Board
- 1992-1995 Ad hoc Grant Reviewer, Sensory Systems Program- NSF
- 1992 Poster Session Organizer, 1st Molecular Biology of Hearing and Deafness Conference
- 1993-1996 Grant Reviewer for the Neurosciences Program, Wellcome Trust, London, UK
- 1993 Ad hoc Member, Sensory Disorders and Language Study Section, NIH/DRG
- 1993-1994 Scientific Review Committee, National Organization for Hearing Research
- 1994 Grant Reviewer, Virginia Sea Grant College Program

- 1994 Outside Reviewer, Hearing Research Study Section- NIH DRG
- 1994 Consultant, Genetics Institute, Cambridge, MA
- 1994 Ad hoc Member, Hearing Research Study Section- NIH/DRG
- 1994 Outside Reviewer of RTC Grants, NIDCD Scientific Review Board
- 1994 Organizing Committee and Invited Speaker, Deafness Research Foundation Conference on the Mechanisms of Sensory Regeneration, Charlottesville, VA.
- 1995-1996 Scientific Panel, NIH National Strategic Research Plan, Hearing and Hearing Impairment Section, NIDCD
- 1996-1997 Ad hoc Member, Communication Disorders Review Committee, NIDCD
- 1996 Book Reviewer, Ear and Hearing
- 1996 Nominating Committee, Association for Research in Otolaryngology
- 1997-1999 Member, Special Emphasis Panel on Small Grants, NIDCD

Major Committee Assignments (continued):

National:

- 1998 Outside Reviewer, Molecular, Cell and Dev. Neurosciences Study Section, NIH
- 1998-1999 Outside Thesis Reviewer, University of Queensland, Australia
- 1998 Grant Reviewer, Alzheimer's Disease Research Center, University of Washington
- 1998-1999 Grant Reviewer, Neurosciences Programme, Wellcome Trust, London, UK
- 1998-2001 Scientific Review Board, Central Institute for the Deaf, St. Louis, MO
- 1999-2002 Secretary/Treasurer, Association for Research in Otolaryngology
- 2000-2001 Deafness Research Foundation Research Task Force
- 2000- Chair, Graduate Student/Postdoc Travel Awards Committee, ARO
- 2001- Advisory Board, Department of Defense Spatial Orientation Center, San Diego, CA.
- 2001-2004 Council of Scientific Trustees, Deafness Research Foundation
- 2001- Chairman, Grants Management Committee, Deafness Research Foundation
- 2002- Ad hoc Member, IFCN-6 Study Section, NIH/CSR
- 2002- Grant Reviewer, NIH/NIDCD Communication Disorders Review Committee
- 2002 Grant Reviewer, Developmental Neurosciences Panel- NSF
- 2002 Grant Reviewer, Sensory Systems Panel- NSF
- 2003 Grant Reviewer, AAO-HNS CORE Study Section
- 2003 Grant Reviewer, Royal National Institute for Deaf People (RNID), London, UK

Professional Societies:

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|-------|---|---|
| 1982- | Association for Research in Otolaryngology | Poster session chair, 1985-99
Nominating Committee, 1996
Secretary/Treasurer, 1999-02 |
| 1983- | American Society for Cell Biology | member |
| 1983- | American Association for the Advancement of Science | member |
| 1983- | Society for Neuroscience | member |
| 2000- | American Society for Matrix Biology | member |

Community Service Related to Professional Work:

- 1999- Scholars Fund Committee, Deafness Research Foundation

- 2000- Graduate Student Travel Award Committee (Chair), Association for Research in Otolaryngology
2001- Scientific Speaker, SHHH (Self Help for Hard of Hearing People) Chapter Meetings

Editorial Boards:

- 1989- Hearing Research
1995- Audiology and Neuro-Otology
2002- Ad hoc Reviewer for: Journal of Neuroscience
Journal of Cell Biology
PNAS
Journal of the Association for Research in Otolaryngology
Journal of Comparative Neurology
Hearing Research
Audiology & Neuro-Otology
Journal of Neurocytology

Awards and Honors:

- 1985 Grass Foundation Fellow, Marine Biological Laboratory, Woods Hole, MA.
- 1987 National Research Council Junior Investigator Award. Granted by the Committee on Hearing, Bioacoustics and Biomechanics (CHABA).
- 1989-1991 Candidate, Charles Judson Herrick Award for Outstanding Young Neuroanatomist, American Association of Anatomists.
- 1993 Proctor & Gamble Teaching Award for Excellence in Teaching in the Basic Sciences, Boston University Goldman School of Graduate Dentistry.
- 1994 Invited Symposium Speaker, Wellcome Trust Meeting on Human Olfaction and Audition: Parallels and Emerging Research Strategies, London, UK.
- 1995 Invited Symposium Speaker, "Frontiers in Hearing Research", Opening Ceremony and Symposium for the Virginia Merrill Bloedel Hearing Research Center, School of Medicine, University of Washington, Seattle, WA.
- 1998 Invited Symposium Speaker, House Ear Institute Inaugural Symposium on Cell and Molecular Biology of the Ear, Pasadena, CA. Loss and Regeneration of Cochlear Hair Cell Innervation Following Sound and Drug Damage.
- 1998 Invited Symposium Speaker, Harvard School of Public Health Department of Environmental Health Symposium on Hearing Impairment: Causes, Prevention, New Treatment Technologies, and Access to Prevention and Technologies. New Technologies for Treatment of Hearing Loss.
- 1998 Invited Speaker, 5th Research Symposium, SHHH National Convention, Boston, MA. Can Hair Cells be Made to Regrow After Cochlear Damage?
- 1998 Invited Symposium Speaker, Symposium on Neuroplasticity, American Speech-Language-Hearing Association (ASHA) 1998 Convention, San Antonio, TX. Hair Cell Regeneration: Theoretical and Practical Implications.
- 1999 Invited Speaker, ARO Educational Symposium on Anatomical Methods for Research in Otolaryngology. St. Petersburg Beach, FL. Confocal Microscopy
- 1999 Invited Symposium Speaker, OHSU Seminar Series on Hearing. Portland OR. Inner Ear Cell Regeneration: Future Potential for Treatment of Hearing Loss.
- 1999 Invited Graduation Speaker, Department of Otolaryngology- Head & Neck Surgery, Henry Ford Hospital, Detroit, MI. Cochlear Hair Cell Regeneration: Future Potential for Treatment of Hearing Loss.
- 2000 Co-Organizer and Speaker, Symposium on Biotechnology and the Cochlea, Alexander Graham Bell Association Annual Convention, Philadelphia, PA.
- 2001 External Advisory Committee and Invited Speaker, Conference on New Frontiers in the Amelioration of Hearing Loss, Central Institute for the Deaf, St. Louis, MO. March 22-25, 2001.
- 2001 Elected to Council of Scientific Trustees, Deafness Research Foundation.

Part II: Research, Teaching, and Clinical Contributions

A. Narrative Report (500 words or less) of Research, Teaching, and Clinical Contributions

The major focus of research in my laboratory over the last several years has been hair cell regeneration. I discovered in 1986 that the chicken cochlea is capable of producing new hair cells to replace those that were lost from noise exposure. This was quite a surprising finding because research at the time indicated that lost hair cells were irreplaceable and led to permanent hearing deficits. Since my initial findings, hair cell regeneration has become the focus of a number of major laboratories and has rapidly developed into an extremely exciting and competitive research area. It is believed that an understanding of avian hair cell regeneration will lead directly to clinical applications that can treat genetic, trauma-induced, or age-related hearing loss in humans.

The current research projects in my laboratory are designed to address the mechanisms which regulate hair cell regeneration, i.e., the control of hair cell death, the subsequent proliferation of the supporting cells and the eventual differentiation of new hair cells. Normally, the sensory epithelium is composed of a postmitotic population of hair cells and supporting cells. Sound damage and aminoglycoside treatment are utilized experimentally to induce the loss of hair cells through apoptosis, or programmed cell death. The loss of hair cells from the sensory epithelium acts as a signal to re-initiate the cell cycle in the quiescent supporting cells. Our goal is to identify the genes and proteins that regulate supporting cell proliferation and lead to the production of new hair cells.

I am also collaborating with Dr. Claude Lechene of Brigham and Women's Hospital to use the MIMS (Multiple Imaging Mass Spectrometer) at BWH to study protein turnover in the cochlea. The MIMS is a new type of spectrophotometer that can measure molecular masses in sections of biological tissue. We are currently studying the turnover of proteins in normal and regenerating chick cochleas.

Recently, I have begun a collaboration with Dr. Matthew W. Kelley at the NIDCD Research Labs in Bethesda. The goal of this project is to develop cochlear stem cells that can be implanted into the inner ear of deaf mice. Once implanted, these cell preparations would be induced to differentiate into functional hearing structures that would connect with existing auditory nerves to re-establish hearing in the deafened animal.

I have also been involved in creating the Harvard Medical School Center for Hereditary Deafness. This multi-Institute Center brings together a number of scientists from a wide spectrum of disciplines who are interested in studying the biology and genetics of hereditary deafness. It was instigated by the recent discovery that mutations in the Connexin26 gene were responsible for a large percentage of patients with nonsyndromic hereditary deafness.

My teaching responsibilities include HST 010 Functional Human Anatomy where I give lectures and teach in the lab, HST 730 The Molecular Biology of the Auditory System where I lecture on hair cell regeneration, and various lectures in other graduate or advanced medical courses at Harvard Medical School.

B. Funding Information.

Research Funding

Previous Funding History

1982 UNC Junior Faculty Development Award, Kathleen K. Sulik, P.I., Douglas A. Cotanche, Co-P.I.; Analysis of the Developing Avian Tegmentum Vasculosum

- 1984 NRSA Postdoctoral Award, Douglas A. Cotanche, P.I., Lewis G. Tilney, Sponsor; The Organization and Function of Actin in Stereocilia
- 1985 Medical University of South Carolina Intramural Research Grant, Douglas A. Cotanche, P.I.; Developmental Control of Hair Cell Morphology
- 1986 Deafness Research Foundation New Investigator Award, Douglas A. Cotanche, P.I.; Hair Cell Response to Acoustic Trauma,

Previous Funding History (continued)

- 1987 BUSM Biomedical Research Support Grant, Douglas A. Cotanche, P.I.; Regeneration in the Cochlear Sensory Epithelium
- 1988 NIH/NIDCD FIRST Award, Douglas A. Cotanche, P.I.; Regulation of Hair Cell Development and Regeneration
- 1989 Deafness Research Foundation, Douglas A. Cotanche, P.I.; Contractile Proteins in the Hyaline Cells of the Chick Cochlea
- 1990 Whitaker Health Sciences Fund BUMC-MIT Collaborative Research Grant, Douglas A. Cotanche and Thomas F. Weiss (MIT), Co-P.I.'s; Video-Enhanced, Computer-Processed Images of the Unfixed Tectorial Membrane
- 1992 NIH/NIDCD RO1 New Submission, Douglas A. Cotanche, P.I.; Cell Form and Gene Expression in Hair Cell Regeneration
- 1995 National Organization for Hearing Research, Douglas A. Cotanche, P.I.; Molecular Identification of Potential Stimulators of Hair Cell Regeneration
- 2001 NIH/NIDCD RO1 Competing Renewal, Douglas A. Cotanche, P.I.; Cell Form and Gene Expression in Hair Cell Regeneration (\$677,533 over 5 years, 36% salary support).
- 1996 American Hearing Research Foundation, Douglas A. Cotanche, P.I.; Regeneration of the Avian Tectorial Membrane
- 1996 National Organization for Hearing Research, Douglas A. Cotanche, P.I.; The Role of FGF and Retinoic Acid in Hair Cell Regeneration
- 1997 National Organization for Hearing Research, Douglas A. Cotanche, P.I.; Regulation and Expression of Genes Involved in Hair Cell Regeneration
- 1998 National Organization for Hearing Research, Douglas A. Cotanche, P.I.; Regulation and Enhancement of Hair Cell Regeneration
NIH/NIDCD KO8, David Roberson, P.I.; Douglas A. Cotanche, Mentor; Genetic Mechanisms of Direct Transdifferentiation.
- 2000 National Organization for Hearing Research, Petula A. Coutinho, P.I., Douglas A. Cotanche, co-P.I.; Molecular Cloning and Expression of Connexin Genes during Development in the Avian Inner
- 2001 Deafness Research Foundation, Petula A. Coutinho, P.I., Douglas A. Cotanche, co-P.I.; How Does Gap Junction Communication Affect Structure and Function in the Normal and Drug Damaged Avian Cochlea?
Deafness Research Foundation, Douglas A. Cotanche, P.I. The Role of Apoptosis in Regulating Hair Cell Death and Supporting Cell Proliferation.

Current Funding

- 2000- NIH/NIDCD RO1, Claude Lechene, P.I.; Douglas A. Cotanche, Co-Investigator; Spatial Dynamics of Protein Turnover in the Cochlea (\$77,350 for 3 years, 12% salary support).
- 2001- National Organization for Hearing Research, Douglas A. Cotanche, P.I., Matthew W. Kelley, Co-P.I. Development of Stem Cell Populations for Utilization in Cochlear Transplantation (\$283,980 over 3 years, 25% salary support).
- 2001- NIH/NIDCD RO1 Douglas A. Cotanche, P.I.; Cell Form and Gene Expression in Hair Cell Regeneration (\$1,250,000 over 5 years, 50% salary support).
- 2002- NIH/NIDCD F32 Mark A. Parker, Ph.D., P.I., Douglas A. Cotanche, Mentor; Therapeutic Effects of Stem Cells on Hearing Loss (\$128,724 over 3 years).

C. Report of Current Research Activities

Bench Research:

Hair Cell Regeneration in the Avian Cochlea
Development of Stem Cells for Cochlear Transplantation
Spatial Dynamics of Protein Turnover in the Cochlea
Glutamate Receptors in Neonatal White Matter Injury

Principal Investigator
Principal Investigator
Co-PI
Co-PI

Clinical Research:

Genetics of Sensorineural Hearing Loss

Co-PI

D. Report of Teaching

1. Local Contributions

a.1 Harvard Medical School

2002- HST 010 Human Functional Anatomy
Lecturer, Lab Instructor
Medical Students and Graduate Students in the HST Program (55)
20 hours per week for 3 month duration of the course

a.2. Boston University School of Medicine

1987-1997 Gross Anatomy for Medical Students
Lecturer, Lab Instructor, Section Director- Thorax, Abdomen & Pelvis, 1990
Medical Students (160), Graduate Students (5)
25 hours per week for 3 month duration of the course

a.3. Goldman School of Graduate Dentistry (Boston University)

1991-1997 Gross Anatomy for Dental Students
Course Co-Director, Lecturer, Lab Instructor
Dental Students (90)
35 hours per week for 3 month duration of the course

b.1. Harvard Medical School graduate medical course

1998-2000 Basic Science Course for Residents, Department of Otolaryngology, Massachusetts
Eye & Ear Infirmary.
Otolaryngology Residents and Research Fellows (10)
One lecture on Embryology of the Ear.
1998-2001 Research Seminar Series, Department of Otolaryngology, Children's Hospital
Series Coordinator
Faculty, Staff, Fellows, Residents (20-30)
Monthly seminar series on research projects ongoing in the Department.
1999- Children's Hospital & Boston Center for Deaf and Hard of Hearing Children Fall
Seminar: Cochlear Implants 101 Just the Facts
Speaker on Cochlear Anatomy with respect to Implants
Audiologists, Speech Pathologists, Teachers, Caregivers in the Greater Boston Area
(80)
2000- HST 730 Molecular Biology of the Auditory System.
Harvard Medical School
Graduate students in the Speech & Hearing Sciences program (10)
One lecture on hair cell regeneration.

b.2. Graduate Program, Boston University School of Medicine

1988-1989 Cell and Developmental Biology, Department of Anatomy & Neurobiology
Course Co-Director

Graduate Students in Anatomy & Neurobiology (10-15)
10 hours per week for one semester each year

1989-1997 Neural Development & Plasticity, Department of Anatomy & Neurobiology
Lecturer, Course Coordinator- 1994
Graduate Students and Postdocs in Anatomy & Neurobiology (10-15)

- b.2. Graduate Program, Boston University School of Medicine (continued)
- 1994-1997 Graduate Seminar in Ethics in Scientific Research, Department of Anatomy & Neurobiology
Course Co-Coordinator
Graduate Students and Postdocs in Anatomy & Neurobiology (10-15)
10 hours per week for two semesters each year

 - 1990-1997 Cell Biology, Division of Graduate Medical Sciences
Lecturer
Graduate students from all departments (30-70)
Two lectures per year plus exam grading

 - 1992-1997 Confocal Microscope Training Course, Division of Graduate Medical Sciences
Course Co-Coordinator, Lecturer
Faculty, Staff, and graduate students at BUSM (30-70)
One week of lectures plus hands-on training on the confocal

 - 1997 Molecular Biology for Neuroscientists, Department of Anatomy & Neurobiology
Course Co-Coordinator
Faculty, Staff, Postdocs, and Graduate Students (20)
10 hours per week for one semester

c. Local Invited Teaching Presentations:

- Boston Center for Deaf and Hard of Hearing Children (BCDC) Fall 1999 Seminar. Cochlear Implants: 101- Just the Facts. Tutorial on cochlear anatomy and structure.
- Invited Speaker, Minuteman Cochlear Implant Club, Norwood, MA November, 2000. The Genetics of Hearing Loss: What We Know and Where We're Headed.
- Invited Speaker, SHHH-NH, Manchester, NH January, 2001. The Genetics of Hearing Loss: What We Know and Where We're Headed.
- Invited Speaker, Children's Hospital at Lexington, Audiology Department, Lexington, MA, February, 2002. Regeneration in the Avian Cochlea: Potential for Human Therapy?
- Invited Speaker, Long Island Chapter of HearUS, Wantaugh, LI. July, 2002. Regeneration in the Avian Cochlea: Potential for Human Therapy?
- Invited Speaker, Southwestern Connecticut Chapter of Self Help for Hard of Hearing People (SHHH), Westport, CT, November, 2002. Hair Cell Regrowth in the Cochlea.

d. Continuing Medical Education:

- Symposium on Regeneration of Hair Cells Following Ototoxic Drugs and Noise Exposure, American Speech-Language-Hearing Association (ASHA) Convention, St. Louis, MO. Regeneration of Hair Cells Following Ototoxic Drugs and Noise Exposure. November 1989.
- Symposium on Auditory Hair Cells and Regeneration, American Speech-Language-Hearing Association (ASHA) Convention, San Antonio, TX. Cell cycle events in hair cell regeneration. November, 1992.
- Symposium on Computational and Structural Biology: The Anatomy of the 21st Century, Joint Meeting of the American Association of Anatomists and Japanese Association of Anatomists. Confocal microscopic imaging of intracellular organization from whole mount tissues. April, 1993.

Grand Rounds Presentation, Department of Otolaryngology- Head and Neck Surgery, Boston University Medical Center, Boston, MA. Hair Cell Regeneration. September, 1996.

Symposium Speaker, Harvard School of Public Health Department of Environmental Health Symposium on Hearing Impairment: Causes, Prevention, New Treatment Technologies, and Access to Prevention and Technologies. New Technologies for Treatment of Hearing Loss. May, 1998.

Symposium Speaker, Symposium on Neuroplasticity, American Speech-Language-Hearing Association (ASHA) 1998 Convention, San Antonio, TX. Hair Cell Regeneration: Theoretical and Practical Implications. November, 1998.

d. Continuing Medical Education (continued):

Symposium Speaker, Seminar Series on Hearing for the Hard-of-Hearing and Deaf Individuals, their Family Members, and Hearing Health Professionals. Sponsored by Oregon Hearing Research Center and OHSU, Portland Oregon. Inner Ear Cell Regeneration: Future Potential for Treatment of Hearing Loss. March, 1999.

Graduation Speaker, Graduation Ceremonies for the Department of Otolaryngology- Head & Neck Surgery, Henry Ford Hospital, Detroit, MI. Cochlear Hair Cell Regeneration: Future Potential for Treatment of Hearing Loss. June, 1999.

Grand Rounds Presentation, University of Iowa Department of Otolaryngology, Iowa City IA Hair Cell Regeneration in the Cochlea and Its Potential as a Treatment for Human Deafness. March, 2001.

e. Advisory or Supervisory Responsibilities in Clinical Setting: N/A

f.. Teaching Leadership Role: N/A

g. Names of advisees or trainees:

Duration of Training	Name	Current Position
8/01-present	Mark A. Parker, PhD	Postdoctoral Fellow, HMS
8/99-7/01	Petula Coutinho, PhD	Postdoctoral Fellow, University College, London
7/99-6/00	Kristina Rosbe, MD	Pediatric Otolaryngologist, UCSF
9/96-12/98	Ann E. Riedl, PhD	Instructor Anatomy & Neurobiology, BUSM
6/97-12/98	Anne K. Hennig, PhD	Research Associate, Washington U., St. Louis, MO
2/01-present	Domenic Mangiardi	Ph.D. candidate, BioMedical Engineering, Boston
6/97-1/00	Cyrus Torchinsky, MD/PhD	Surgical Intern
6/92-12/95	Kenneth Lee, MD/PhD	Resident in Otolaryngology, Washington U.,
9/89-6/93	Jennifer S. Stone, PhD	Asst Professor, Dept. of Otolaryngology, U. of
9/94-6/96	Michael S. Ofsie, MA	Graphic Designer, Musician, New York City
9/93-6/95	Jonathan E. Epstein, MA/MD	Resident in Emergency Medicine, Albert Einstein
9/94-6/95	Kristina Kovatch, MA/MD	Physician
9/92-6/94	Philip Massengill, MA/MD	Otolaryngologist, Tacoma, WA
9/90-6/91	Alicia Petrell, MA	Unknown
9/88-6/90	Monica Shiel, MA	Pharmaceutical Biotech, Los Angeles, CA

2. Regional, National, or International Contributions

a. Invited Presentations

1987 Invited Seminar Speaker, BU Small Hearing Group Meeting, Department of Biomedical Engineering, Boston University, Boston, MA. Regulation of Hair Cell Development and Regeneration.

- 1988 Invited Seminar Speaker, Eaton-Peabody Laboratory, Department of Otolaryngology and Laryngology, Massachusetts Eye and Ear Infirmary, Boston, MA. Regulation of Hair Cell Development and Regeneration.
Invited Participant, Mechanics of Hearing 1988, a NATO Advanced Research Workshop, University of Keele, Staffordshire, UK
Invited Seminar Speaker, MRC Neurophysiology Group, University of Sussex, Brighton, U.K. Sensory Cell Regeneration in the Avian Cochlea.
Invited Seminar Speaker, Department of Physiology, The Medical School, University of Bristol, Bristol, U.K. Sensory Cell Regeneration in the Avian Cochlea.
Invited Seminar Speaker, BU Small Hearing Group Meeting, Department of Biomedical Engineering, Boston University, Boston, MA. Structure of the Avian Tectorial Membrane: Possibilities for a Bimodal Function.

2. Regional, National, or International Contributions (cont'd)

- 1989 Invited Seminar Speaker, Department of Cell Biology and Anatomy, School of Medicine, University of North Carolina at Chapel Hill. Regulation of Stereocilia Growth in Developing and Regenerating Cochlear Hair Cells.
Invited Seminar Speaker, The Hair Cell Group, School of Medicine, University of North Carolina at Chapel Hill. Speculations on the Role of the Tectorial Membrane and Hyaline Cells in Basilar Membrane Mechanics.
Invited Seminar Speaker, Department of Anatomy and Cellular Biology, Tufts University School of Medicine, Boston, MA. Regulation of Stereocilia Growth in Developing and Regenerating Cochlear Hair Cells.
Invited Seminar Speaker, Eaton-Peabody Laboratory, Massachusetts Eye and Ear Infirmary, Boston, MA. Speculations on the Role of the Tectorial Membrane and Hyaline Cells in Basilar Membrane Mechanics.
Invited Symposium Speaker, Symposium on Regeneration of Hair Cells Following Ototoxic Drugs and Noise Exposure, American Speech-Language-Hearing Association (ASHA) Convention, St. Louis, MO. Regeneration of Hair Cells Following Ototoxic Drugs and Noise Exposure.
Invited Seminar Speaker, Department of Otolaryngology, University of Washington, Seattle, WA. Common Mechanisms in the Development and Regeneration of Hair Cells in the Chick Cochlea.
- 1990 Invited Seminar Speaker, Department of Otolaryngology, The Children's Hospital, Harvard Medical School, Boston, MA. Stereocilia-Tectorial Membrane Interactions During Development, Noise Damage and Regeneration.
Invited Symposium Speaker, Ciba Foundation Symposium on Regeneration of Sensory Receptor Cells in Vertebrates, The Ciba Foundation, London, UK. Structural reorganization of hair cells and supporting cells during noise damage, recovery, and regeneration in the chick cochlea.
Invited Seminar Speaker, Department of Otolaryngology, University of Washington, Seattle, WA. Contractile Proteins in the Hyaline Cells of the Chick Cochlea.
Invited Seminar Speaker, "Tectorial Membrane-Stereocilia Interactions During Cochlear Development and Regeneration" Oct. 5, 1990. Department of Pathology, Boston University School of Medicine, Boston, MA.

- Invited Seminar Speaker, Whitaker Health Sciences Fund Faculty Research Presentation Meeting, Massachusetts Institute of Technology, Cambridge, MA. Video-Enhanced, Computer-Processed Images of the Unfixed Tectorial Membrane.
- 1991 Invited Seminar Speaker, Central Institute for the Deaf, St. Louis, MO. Development and Regeneration of Hair Cells and the Tectorial Membrane in the Chick Cochlea.
- Invited Participant, First Conference on Biological Replacement in Sensory Systems, Central Institute for the Deaf, St. Louis, MO.
- Kresge Hearing Research Institute, University of Michigan, Ann Arbor, MI. Hair Cell and Tectorial Membrane Regeneration in the Chick Cochlea.
- Department of Otolaryngology, University of Washington, Seattle, WA. Ear Stuff.
- Invited Seminar Speaker, Department of Otolaryngology, University of Rochester School of Medicine, Rochester, N.Y. Birds Do It: Hair Cell Regeneration in the Chicken Cochlea.
- Invited Seminar Speaker, Department of Biomedical Engineering, Boston University, Boston, MA. Birds Do It: Hair Cell Regeneration in the Chicken Cochlea.
- Invited Seminar Speaker, Department of Anatomy & Neurobiology, Boston University School of Medicine, Boston, MA. Birds Do It: Hair Cell Regeneration in the Chick Cochlea.

2. Regional, National, or International Contributions (cont'd)

- 1992 Invited Seminar Speaker, Department of Otolaryngology, University of Kansas Medical Center, Kansas City, KS. Birds Do It: Hair Cell Regeneration in the Chick Cochlea.
Invited Symposium Speaker, Symposium on Auditory Hair Cells and Regeneration, American Speech-Language-Hearing Association (ASHA) Convention, San Antonio, TX. Cell cycle events in hair cell regeneration.
Invited Seminar Speaker, Genetics Institute, Cambridge, MA. Cell Cycle Events During Cochlear Hair Cell Regeneration.
- 1993 Invited Seminar Speaker, Department of Anatomy & Cell Biology, Tufts University, Boston, MA. Timing of S Phase and Patterns of Cell Proliferation During Hair Cell Regeneration.
Invited Seminar Speaker, Department of Anatomy & Neurobiology, Washington University School of Medicine, St. Louis. MO. Regeneration in the Chick Cochlea.
Invited Symposium Speaker, Workshop on the Effect of Noise on Birds, Hubbs-Sea World Research Institute, San Diego, CA. Noise-induced damage in the avian ear.
Invited Symposium Speaker, Symposium on Computational and Structural Biology: The Anatomy of the 21st Century, Joint Meeting of the American Association of Anatomists and Japanese Association of Anatomists. Confocal microscopic imaging of intracellular organization from whole mount tissues.
Invited Symposium Speaker, Hearing Research Trust Workshop: Repair and Regeneration in the Inner Ear, Wye College, Wye, Kent, UK. Early events in cell damage and progenitor stimulation during noise induced hair cell regeneration in the chick cochlea.
Invited Seminar Speaker, House Ear Institute, Los Angeles, CA. Hair Cell Regeneration in the Cochlea.
- 1994 Invited Seminar Speaker, Center for Neurodegenerative Disease Research, Department of Pathology and Laboratory Medicine, University of Pennsylvania, Philadelphia, PA. Hair Cell Regeneration in the Chick Cochlea.
Invited Seminar Speaker, Baule Colloquium Series of the Institute for Sensory Research, Syracuse University, Syracuse, NY. Regulation of Hair Cell Regeneration in the Cochlea.
Invited Seminar Speaker, The Shriver Mental Retardation Research Center, Waltham, MA. Hair Cell Regeneration in the Inner Ear.
Invited Symposium Speaker, Wellcome Trust Meeting on Human Olfaction and Audition: Parallels and Emerging Research Strategies, London, UK. Hair Cell Regeneration in the Cochlea: Possibilities for Therapeutic Use.
Invited Symposium Speaker, Deafness Research Foundation Conference on the Mechanisms of Sensory Regeneration, Charlottesville, VA. Regeneration in the Avian Cochlea.
- 1995 Invited Seminar Speaker, Hearing Research Group, Department of Biomedical Engineering, Boston University, Boston, MA. Interactions between cytoskeletal proteins and the extracellular matrix in hair cells and supporting cells of the chick cochlea.
Invited Seminar Speaker, Department of Zoology, University of Maryland, College Park, MD. Hair Cell Regeneration in the Inner Ear.
Invited Symposium Speaker, "Frontiers in Hearing Research", Opening Ceremony and Symposium for the Virginia Merrill Bloedel Hearing Research Center, School of

Medicine, University of Washington, Seattle, WA. Hair cell regeneration in the avian cochlea.

Invited Seminar Speaker, R.L. Smith Mental Retardation and Human Development Research Center, University of Kansas Medical Center, Kansas City, KS. Hair Cell Regeneration in the Inner Ear.

Invited Seminar Speaker, Department of Biology, Boston College, Chestnut Hill, MA. Hair cell regeneration in the avian cochlea.

2. Regional, National, or International Contributions (cont'd)

- 1995 Invited Seminar Speaker, R.S. Dow Neurological Sciences Institute, Portland, OR. The Role of Growth Factors and Extracellular Matrix Proteins in Hair Cell Regeneration.
- 1996 Invited Seminar Speaker, Grand Rounds, Department of Otolaryngology- Head and Neck Surgery, Boston University Medical Center, Boston, MA. Hair Cell Regeneration.
- 1997 Invited Seminar Speaker, Ontogeny, Inc., Cambridge, MA. The Role of Growth Factors in Regulating Hair Cell Regeneration.
Invited Seminar Speaker, Kresge Hearing Research Institute, University of Michigan, Ann Arbor, MI. The Role of Growth Factors in Regulating Hair Cell Regeneration.
Invited Seminar Speaker, Department of Otolaryngology and Communication Disorders, Children's Hospital, Boston, MA. The Role of Growth Factors in Regulating Hair Cell Regeneration.
Invited Seminar Speaker, Department of Anatomy and Neurobiology, Boston University Medical Center, Boston, MA. Loss and Recovery of Efferent Innervation to the Hair Cells in the Regenerating Chick Cochlea.
Invited Seminar Speaker, League for the Hard of Hearing, New York, NY. Hair Cell Regeneration : The Reality and The Possibilities.
- 1998 Invited Symposium Speaker, House Ear Institute Inaugural Symposium on Cell and Molecular Biology of the Ear, Pasadena, CA. Loss and Regeneration of Cochlear Hair Cell Innervation Following Sound and Drug Damage.
Invited Symposium Speaker, Harvard School of Public Health Department of Environmental Health Symposium on Hearing Impairment: Causes, Prevention, New Treatment Technologies, and Access to Prevention and Technologies. New Technologies for Treatment of Hearing Loss.
Invited Seminar Speaker, Eaton-Peabody Laboratory, Mass Eye & Ear Infirmary, Boston, MA Regeneration of Cochlear Efferent Nerve Terminals After Sound Damage and Gentamicin Treatment.
Invited Symposium Speaker, 5th Research Symposium, SHHH National Convention, Boston, MA. Can Hair Cells be Made to Regrow After Cochlear Damage?
Invited Seminar Speaker, Diacrin, Inc. Biotechnology Company, Cochlear Hair Cell Regeneration
Invited Symposium Speaker, Symposium on Neuroplasticity, American Speech-Language-Hearing Association (ASHA) 1998 Convention, San Antonio, TX. Hair Cell Regeneration: Theoretical and Practical Implications.
- 1999 Invited Symposium Speaker, ARO Educational Symposium on Anatomical Methods for Research in Otolaryngology. St. Petersburg Beach, FL. Confocal Microscopy.
Invited Symposium Speaker, Seminar Series on Hearing for the Hard-of-Hearing and Deaf Individuals, their Family Members, and Hearing Health Professionals. Sponsored by Oregon Hearing Research Center and OHSU, Portland Oregon. Inner Ear Cell Regeneration: Future Potential for Treatment of Hearing Loss.
Invited Graduation Speaker, Graduation Ceremonies for the Department of Otolaryngology- Head & Neck Surgery, Henry Ford Hospital, Detroit, MI. Cochlear Hair Cell Regeneration: Future Potential for Treatment of Hearing Loss.
Invited Speaker, Fundraising Event for the Deafness Research Foundation in support of the National Campaign for Hearing Health, The Yale Club, New York, NY. Hair Cell Regeneration in the Cochlea and its Potential as a Treatment for Human Deafness.

- 2000 Invited Seminar Speaker, Molecular Mechanisms of Hearing and Balance Seminar Series, Harvard Medical School Center for Hereditary Deafness. Cell Death and Proliferation in Regeneration.
- Co-Organizer and Speaker, Symposium on Biotechnology and the Cochlea, Alexander Graham Bell Association Annual Convention, Philadelphia, PA July, 2000. Hair Cell Regeneration and the Development of a Biological Cochlear Implant.

2. Regional, National, or International Contributions (cont'd)

- 2000 Invited Speaker, CORLAS Meeting, Washington, DC August 2000. Aminoglycoside treatment alters TIAR expression in apoptotic hair cells.
Invited Speaker, Minuteman Cochlear Implant Club, Norwood, MA November, 2000. The Genetics of Hearing Loss: What We Know and Where We're Headed.
- 2001 Invited Speaker, SHHH-NH, Manchester, NH January, 2001. The Genetics of Hearing Loss: What We Know and Where We're Headed.
Invited Seminar Speaker, University of Iowa Otolaryngology Research Group, Iowa City IA March 19, 2001. Cell Death and Proliferation in Regeneration.
Invited Seminar Speaker, University of Iowa Department of Otolaryngology Grand Rounds, Iowa City IA March 20, 2001. Hair Cell Regeneration in the Cochlea and Its Potential as a Treatment for Human Deafness.
Invited Symposium Speaker, Conference on New Frontiers in the Amelioration of Hearing Loss, Central Institute for the Deaf, St. Louis, MO. March 22-25, 2001. Activating Influences on Supporting Cell Proliferation in the Regenerating Avian Cochlea.
- 2002 Invited Seminar Speaker, Children's Hospital at Lexington, Audiology Department, Lexington, MA, February 26, 2002. Regeneration in the Avian Cochlea: Potential for Human Therapy?
Invited Seminar Speaker, University of Kansas Medical Center, Department of Otolaryngology, Kansas City KS, July 11, 2002. Hair Cell Regeneration- A Tightly Coupled Dance of Death and Proliferation.
Invited Seminar Speaker, Long Island Chapter of HearUS, Wantaugh, LI. July 17, 2002. Regeneration in the Avian Cochlea: Potential for Human Therapy?
Invited Seminar Speaker, Southwestern Connecticut Chapter of Self Help for Hard of Hearing People (SHHH), Westport, CT, November 16, 2002. Hair Cell Regrowth in the Cochlea.
- 2003 Invited Seminar Speaker, Massachusetts Eye & Ear Infirmary, Department of Otolaryngology, Boston, MA, Jan. 10, 2003. Hair Cell Regeneration- A Tightly Coupled Dance of Death and Proliferation.
Invited Seminar Speaker, Children's Hospital-Boston, Department of Nephrology, Boston, MA, Jan. 30, 2003. Hair Cell Regeneration- A Tightly Coupled Dance of Death and Proliferation.
Invited Seminar Speaker, University of Michigan, Department of Otolaryngology, Ann Arbor, MI, April 9, 2003. Hair Cell Regeneration in the Avian Cochlea: Progress and Potential for Human Therapy.
Invited Seminar Speaker, Cochlear CONNecTion, the Connecticut Chapter of CIAI, New Haven, CT, May 21, 2003. Hair Cell Regeneration in the Cochlea: Potential for Human Therapy?
Invited Symposium Speaker, Northeast Cochlear Implant Convention, Sturbridge, MA, July 12, 2003. Hair Cell Regeneration in the Cochlea: Potential for Human Therapy?

3. Description of Teaching Awards

- 1993 Proctor and Gamble Teaching Award for Excellence in Teaching in the Basic Sciences, Goldman School of Graduate Dentistry, Boston University

4. Major Curriculum Offerings, teaching cases or innovative educational programs developed

1990 Lecture Notes and Case Questions for Thorax, Abdomen & Pelvis section of Human Gross Anatomy, Department of Anatomy, Boston University School of Medicine.

1999 Syllabus for Confocal Microscopy Tutorial, ARO Educational Symposium on Anatomical Methods for Research in Otolaryngology

E. Report of Clinical Activities

none

Part III: Bibliography:

Original Articles

- Cotanche, DA, Sulik, KK. Scanning electron microscopy of the developing chick tegmentum vasculosum. *Scanning Electron Microscopy/1982/III*, 1283-1294.
- Cotanche, DA, Sulik, KK. Early differentiation of hair cells in the embryonic chick basilar papilla. *Arch. Otorhinolaryngol.* 1983;237:191-195.
- Cotanche, DA, Sulik, KK. The development of stereociliary bundles in the cochlear duct of chick embryos. *Developmental Brain Research* 1984;16:181-193.
- Cotanche, DA, Sulik, KK. Parameters of growth in the embryonic and neonatal chick basilar papilla. *Scanning Electron Microscopy/1985/I*, 407-417.
- Cotanche, DA, Cotton, CU, Gatzky, JT, Sulik, KK. Ultrastructural and electrophysiological maturation of the chick tegmentum vasculosum. *Hearing Res.*1987;25:125-139.
- Cotanche, DA, Saunders, JC, Tilney, LG. Hair cell damage produced by acoustic trauma in the chick cochlea. *Hearing Res.* 1987;25:267-286.
- Cotanche, DA. Development of hair cell stereocilia in the avian cochlea. *Hearing Res.* 1987;28:35-44.
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- Cotanche, DA. Regeneration of the tectorial membrane in the chick cochlea following severe acoustic trauma. *Hearing Res.* 1987;30:197-206.
- Schneider, ME, Cotanche, DA, Fambrough, DM, Matschinsky, FM. The cellular distribution of the Na⁺-K⁺ ATPase in the chick cochlea. *Hearing Res.* 1987;31:39-44.
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- Corwin, JT, Cotanche, DA. Regeneration of sensory hair cells after acoustic trauma. *Science* 1988;240:1772-1774.
- Tilney, LG, Tilney, MS, Cotanche, DA. New observations on the stereocilia of tall and short hair cells of the chicken cochlea. *Hearing Res.* 1988;37:71-82.
- Tilney, MS, Tilney, LG, Stephens, RE, Merte, C, Drenckhahn, D, Cotanche, DA, Bretscher, A. Preliminary biochemical characterization of the stereocilia and cuticular plate of hair cells of the chick cochlea. *J. Cell Biol.* 1989;109:1711-1723.
- Corwin, JT, Cotanche, DA. The development of location-specific hair cell stereocilia in denervated embryonic ears. *J. Comp. Neurol.*1989; 288:529-537.
- Cotanche, DA, Dopyera, CEJ. Effects of acoustic trauma on hair cells and supporting cells in the chick cochlea. *Hearing Research* 1990;46:29-40.
- Shiel, MJ, Cotanche, DA. SEM analysis of the developing tectorial membrane in the chick cochlea. *Hearing Research* 1990;47:147-158.
- Cotanche, DA, Corwin, JT. Stereocilia bundles reorient during hair cell development and regeneration in the chick ear. *Hearing Res.* 1991;52:379-402.
- Stone, JS, Cotanche, DA. Hair cell differentiation in the developing chick cochlea and in embryonic cochlear organ culture. *J. Comp. Neurol.* 1991;314:614-625.
- Cotanche, DA. Video-enhanced DIC images of the noise-damaged and regenerated chick tectorial membrane. *Experimental Neurology* 1992;115:23-26.
- Stone, JS, Cotanche, DA. Synchronization of hair cell regeneration in the chick cochlea following noise damage. *J. Cell Science* 1992;102:671-680.

- Cotanche, DA, Henson, MM, Henson, OW Jr. Contractile proteins in the hyaline cells of the chicken cochlea. *J. Comp. Neurol.*1992; 324:353-364.
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- Lee, KH, Cotanche, DA. Detection of β -actin mRNA by RT-PCR in normal and regenerating chicken cochleae. *Hearing Res.* 1995;87:9-15.
- Epstein, JE, Cotanche, DA. Secretion of a new basal layer of tectorial membrane following gentamicin-induced hair cell loss. *Hearing Res.* 1995;90:31-43.
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- Dai, C.F., D.A. Mangiardi, D.A. Cotanche, and P. S. Steyger. Accumulation of fluorescent gentamicin by vertebrate hair cells in vivo. *Hearing Research* 2003, in preparation.
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- Cotanche, D.A., E.P. Messana, and P.A. Coutinho. Activating influences on supporting cell proliferation in the regenerating avian cochlea. *Seminars in Hearing* 2003; 24:167-168.

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- Cotanche, DA, Lee, KH, Stone, Picard, DA. Hair cell regeneration in the bird cochlea following noise damage or ototoxic drug damage: A review. *Anatomy & Embryology* 1994;189:1-18.
- Cotanche, DA, Lee, KH. Regeneration of hair cells in the vestibulocochlear system of birds and mammals. *Current Opinion in Neurobiology* 1994;4:509-514.
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1995. p. 22-42. *(Note: due to an editorial error the name of Douglas A. Cotanche was inadvertently omitted as an author of Chapter 4 and from the list of contributors, table of contents and first page of the chapter. An erratum has been issued to be included in the first printing and the second printing will be revised to correct the error).

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- Cotanche DA, PA Coutinho. Activating and inhibitory influences on proliferation in the regenerating avian cochlea. *Conference on New Frontiers in the Amelioration of Hearing Loss Abstr.* 2001: 13.
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