

# COLLEGE OF MEDICINE CURRICULUM VITAE

Jay T. Rubinstein, M.D., Ph.D.

August 12, 2018

## I. EDUCATION AND PROFESSIONAL HISTORY

### Education

1981	Sc.B. with Honors	Brown University	(Engineering)
1983	Sc.M.	Brown University	(Engineering)
1987	M.D. with Honors	University of Washington	
1988	Ph.D.	University of Washington	(Bioengineering)

### Internships and Residencies

1988-89	Intern (Surgery), Beth Israel Hospital, Boston MA
1990-94	Resident (Otolaryngology), Massachusetts Eye & Ear Infirmary, Boston, MA

### Clinical and Research Fellowships

1988	Research Fellow, Department of Physiology and Biophysics, University of Washington, Seattle WA
1989-90	Research Fellow, Department of Otology and Laryngology, Harvard Medical School
1994-95	Clinical Fellow in Otology/Neurotology, Department of Otolaryngology, The University of Iowa Hospitals and Clinics, Iowa City IA

### Academic Appointments

1989-95	Research Affiliate, Research Laboratory of Electronics, Massachusetts Institute of Technology
1994-95	Fellow Associate, The University of Iowa Hospitals and Clinics, Iowa City IA
1995-00	Assistant Professor, Department of Otolaryngology-Head and Neck Surgery, The University of Iowa Hospitals and Clinics
1997-04	Faculty Appointment, Interdisciplinary Neuroscience PhD Program, The University of Iowa
1996-00	Assistant Professor, Department of Physiology & Biophysics, The University of Iowa
2000-04	Associate Professor with Tenure, Department of Otolaryngology-Head and Neck Surgery, The University of Iowa
2000-04	Associate Professor, Department of Physiology & Biophysics, The University of Iowa
2000-04	Associate Professor, Department of Biomedical Engineering, The University of Iowa
2003-04	Boerhaave Professor, Leiden University, The Netherlands
2004-	Virginia Merrill Bloedel Professor and Director, Virginia Merrill Bloedel Hearing Research Center, University of Washington

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- 2004- Professor of Otolaryngology–Head and Neck Surgery, University of Washington
- 2004-05 Adjunct Professor of Bioengineering, University of Washington
- 2005- Professor of Bioengineering, University of Washington
- 2012- Research Affiliate, Washington National Primate Research Center

Other Employment Pertaining to Current Professional Appointments

- 1975-77 Software Developer, Telmar Communications Corp., New York NY
- 1979 Research Assistant, Geoelectromagnetics Laboratory, Department of Geological Sciences, Brown University, Providence RI
- 1980-81 Research Assistant, Visual Physiology Laboratory, Division of Engineering and Center for Neural Science, Brown University, Providence RI
- 1980-82 Teaching Assistant, Digital Electronics Laboratory, Division of Engineering, Brown University, Providence RI
- 1981-82 Research Assistant, Laboratory for Engineering Man/Machine Systems, Division of Engineering, Brown University, Providence RI
- 1996-04 Attending Surgeon, VA Medical Center, Iowa City, Iowa
- 2005- Board of Trustees, Listen & Talk School, Seattle, WA
- 2006-08 Board of Trustees, Executive Committee, Northwest Lions Foundation for Sight and Hearing, Seattle, WA
- 2006-12 Chairman, Board of Trustees, Audient, LLC, Seattle, WA
- 2008-12 Board of Directors, SightLife, LLC, Seattle, WA
- 2010- Medical Advisory Board, National Organization for Hearing Research

Certification and Licensure

**Certification**

- 1995 Diplomate, American Board of Otolaryngology--Head and Neck Surgery
- 2005 Neurotology Certificate of Added Qualifications
- 2013 Neurotology Certificate renewal

**Licensure**

- 1994 Iowa License #29758 (expired)
- 1994 California License (expired)
- 1994 Massachusetts License (expired)
- 2004 Washington License MD00044088 (active)

Honors and Awards

- 1981 Honorary Undergraduate Teaching Assistantship
- 1981 Sigma Xi
- 1984-86 Poncin Scholarship Award
- 1987 Alpha Omega Alpha
- 1992 American Academy of Otolaryngology Resident Research Grant

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- 2003-04 Boerhaave Professor, Leiden University, the Netherlands
- 2005-06 Best Doctors in America
- 2006 Elected Senior Member of the IEEE
- 2006 Elected to the Collegium Oto-Rhino-Laryngologicum Amicitiae Sacrum
- 2007-08 President-elect, American Auditory Society
- 2007-08 Best Doctors in America
- 2009 Presidential Citation, American Otologic Society
- 2009-10 President, American Auditory Society
- 2009 Honor Award, American Academy of Otolaryngology – HNS
- 2009-10 Best Doctors in America
- 2010-11 Best Doctors in America
- 2012-13 President-elect, Association for Research in Otolaryngology
- 2012 Seattle Top Doctors
- 2013-14 President, Association for Research in Otolaryngology
- 2014-15 Past-President, Association for Research in Otolaryngology
- 2015 Americas Top Doctors
- 2016 Seattle Top Doctors
- 2017 Seattle Top Doctors
- 2018-21 President-Elect, The Politzer Society
- 2018 America's Top Doctors 5 years

## II. TEACHING

### Classroom, Seminar, or Teaching Laboratory

- 1980-82 Teaching Assistant, Digital Electronics Laboratory, Brown University
- 1994-03 Weekly Neurotology Conference - lectures to otolaryngology residents and supervision of temporal bone dissection.
- 1994-03 Otolaryngology Basic Science Course
- 1995-03 Lectures to first & third year medical students on physiology & pathophysiology of the ear.
- 1997-03 Lectures to neuroscience graduate students on auditory physiology
- 2000-03 Lectures to primary care physicians on management of tinnitus, dizziness and hearing loss

### Clinical Teaching (in ward, clinic, or operating room)

Otolaryngology Residents, Fellows and Medical Students

### Teaching Activities Other Than Classroom or Clinical

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- 1991-92 Assisted in undergraduate thesis supervision for Konstantina M. Trbovic, "Modeling of Auditory Nerve Responses to Electrical Stimulation," Department of Physics, Massachusetts Institute of Technology
- 1994 External thesis reader for Johan Frijns, MD, PhD. "Cochlear Implants, A Modeling Approach", Department of ENT, Leiden, Netherlands.
- 2000 PhD Committee for Leonid Litvak, Harvard/MIT Speech & Hearing Science Program.
- 2000 PhD Committee for Karen Chi, Department of Speech Pathology and Audiology, University of Iowa
- 2001 PhD Committee for Christina Runge, Department of Speech Pathology and Audiology, University of Iowa
- 2001-03 Mentor, Doris Duke Clinical Research Fellowship Program, University of Iowa
- 2003 PhD Committee for Tiffany Johnson, Department of Speech Pathology and Audiology, University of Iowa
- 2005-07 Research mentor Chad Ruffin, visiting Howard Hughes Fellow.
- 2005-06 Research mentor Grace Liu, MD visiting medical student.
- 2005-06 PhD Committee for Lendra Friesen, Department of Speech and Hearing Sciences, University of Washington
- 2007 PhD Committee for Olivier Macherey, University of Leuven, Belgium, "Effects of Stimulus Waveform on Hearing with Cochlear Implants"
- 2007 External Thesis Reader for JE Smit, University of Pretoria, "Modeled Response of the Electrically Stimulated Nerve Fiber"
- 2008- PhD Committee for Katie Faulkner, Department of Speech and Hearing Sciences, University of Washington

Clinical Activities

A. Inpatient

Surgery performed 1.5 day per week in operating rooms of UW Medical Center and Seattle Childrens

B. Outpatient

Patient appointments 1.5 days per week

Master's and Ph.D. Theses Directed and Postdoctoral Fellows Supervised

- 1992-93 Committee Member and Thesis Reader for Masters Degree Candidate Eric R. Stutman, Thesis Titled "A Model for Temporal Sensitivity of Neurons in the Auditory Brainstem: The Role of a Slow, Low-Threshold Potassium Conductance," Department of Biomedical Engineering, Boston University
- 1995-96 Charles Miller, PhD - Postdoctoral Fellow. Physiology of electrically stimulated spiral ganglion cells, University of Iowa.
- 1995-96 Akihiro Matsuoka, MD, PhD. Response of auditory nerve to pulse trains. Dept of Speech Pathology & Audiology, University of Iowa.

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- 1999-02 Nahla Hussein, MD. Doctoral Thesis, Suez Canal University, Egypt
- 2001-03 Gang Chen, MSE student, Dept. of Electrical Engineering, U. of I.
- 2001-03 Haiming Chen, MSE thesis, Dept. of Electrical Engineering, Radial-longitudinal impedance model for human cochlear implants.
- 2002-03 Ron Andreatta, MSE student, Dept of Biomedical Engineering, U. of I.
- 2002-03 Robert Hong, MD, Doris Duke Fellow, University of Iowa.
- 2005-07 Jeff Longnion, MD/PhD student in bioengineering, UW
- 2005-11 Jong Ho Won, PhD student in bioengineering, UW
- 2005-09 Vasant Dasika, PhD. Postdoctoral fellow, UW.
- 2005-06 Steven Bierer, PhD. Postdoctoral fellow, UW.
- 2005-06 Robert Kang, MD, Otolaryngology-HNS resident, UW.
- 2007-08 Seeyoun Kwon, Visiting bioengineering graduate student, Hanyang University, Seoul.
- 2007-11 Nikita Imennov, PhD student in bioengineering, UW.
- 2009-10 Kyu Hwan Jung, MD, Visiting Fellow, Samsung Medical Center, Seoul.
- 2010-11 Minhyun Park, MD, Seoul National University, Seoul.
- 2010-11 Akinori Kashio, MD, Tokyo University, Tokyo
- 2011-12 Hyun-Joon Shim, MD, Seoul National University
- 2012-14 Il-Joon Moon, MD, Samsung Medical Center, Seoul
- 2009-12 Gary Jones, PhD, Postdoctoral fellow, UW
- 2014-16 Elle O'Brien, PhD student in neurobiology, UW
- 2016- Jesse Resnick, MD, PhD student in neurobiology, UW

Clinical Fellows Supervised

- 1996-98 Paul Gidley, MD. Currently Professor, Department of Head and Neck Surgery, University of Texas MD Anderson Cancer Center,
- 1998-00 Brian Perry, MD. Currently in private practice, San Antonio, TX
- 2000-02 Ravi Samy, MD. Currently Associate Professor, Department of Otolaryngology, University of Cincinnati
- 2002-04 Ted Meyer, MD, PhD. Currently Associate Professor, Medical University of South Carolina
- 2011-12 Michal Preis, MD. Currently an otolaryngologist at Maimonides Medical Center, Brooklyn, NY
- 2014-15 Kavita Dedhia, MD. Currently Assistant Professor, Department of Otolaryngology, Emory University, Atlanta GA

**III. SCHOLARSHIP**

Papers Published

1. **Rubinstein J.T.** and Silverman, H.F. Some Comments on the Design and Implementation of FIR Filterbanks for Speech Recognition. In: Proceedings of

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- the IEEE International Conference on Acoustics, Speech and Signal Processing. IEEE Speech and Signal Processing Society 812-815, 1983.
2. Soma, M., Spelman, F.A. and **Rubinstein, J.T.** Fields Produced by the Cochlear Prosthesis: The Ear as a Multilayered Medium. In: Frontiers of Engineering and Computing in Health Care. Boston: IEEE Engineering in Medicine and Biology Society 401-405, 1984.
  3. **Rubinstein, J.T.**, Spelman, FA and Soma, M. Mixed Boundary Value Problems in the Implanted Cochlea. In: Frontiers of Engineering and Computing in Health Care. IEEE Engineering in Medicine and Biology Society 1120-1123, 1985.
  4. **Rubinstein, J.T.**, Suesserman, M.F. and Spelman, F.A. Measurements and Models of Recessed Electrodes. Proceedings of the Ninth Annual Conference of the IEEE Engineering in Medicine and Biology Society. Boston: IEEE Engineering in Medicine and Biology Society 913-914, 1987.
  5. **Rubinstein, J.T.**, Spelman, F.A., Soma, M. and Suesserman, M.F. Current Density Profiles of Surface Mounted and Recessed Electrodes for Neural Prostheses. IEEE Transactions Biomedical Engineering BME 34:864-874, 1987.
  6. **Rubinstein, J.T.** and Spelman, F.A. Analytical Theory for Extracellular Electrical Stimulation of Nerve with Focal Electrodes 1: Passive Unmyelinated Axon. Biophysical Journal 54:975-981, 1988.
  7. Suesserman, M.F., Spelman, F.A. and **Rubinstein, J.T.** In-Vitro Measurement and Characterization of Current Density Profiles Produced by Nonrecessed, Simple Recessed, and Radially Varying Recessed Stimulating Electrodes. IEEE Transactions on Biomedical Engineering 38(5):401-408, 1991.
  8. **Rubinstein, J.T.** Analytical Theory for Extracellular Electrical Stimulation of Nerve with Focal Electrodes 2: Passive Myelinated Axon. Biophysical Journal 60: 538-555, 1991.
  9. **Rubinstein, J.T.** Axon Termination Conditions for Electrical Stimulation. IEEE Transactions on Biomedical Engineering 40(7):654-663, 1993.
  10. **Rubinstein, J.T.** Threshold Fluctuations in an N Sodium Channel Model of the Node of Ranvier. Biophysical Journal 68:779-785, 1995.

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11. Zbar RIS, Megerian CA, Khan A, **Rubinstein JT**. Invisible Culprit: Intralabyrinthine Schwannomas that do not appear on Enhanced Magnetic Resonance Imaging. *Annals of Otolaryngology, Rhinology & Laryngology*, 106(9):739-742, September 1997.
12. Arcuri MR and **Rubinstein JT**. Facial Implants. *Dental Clinics of North America*, Vol 42, Number 1, January 1998
13. Miller CA, Abbas PJ, **Rubinstein JT**, Robinson BK, Matsuoka AJ, Woodworth G. Electrically evoked compound action potentials of Guinea pig and cat: responses to monopolar, monophasic stimulation. *Hear. Research* 119(1-2):142-154, 1998.
14. **Rubinstein JT**, Parkinson WS, Lowder MW, Gantz BJ, Tyler RS. Single-channel to multichannel conversions in adult cochlear implant subjects. *American Journal of Otolaryngology*, 19 (4): 461-466, July, 1998.
15. **Rubinstein JT**, Gantz BJ, Parkinson WS. Management of cochlear implant infections. *American Journal of Otolaryngology*, 20 (1) 46-49, 1999.
16. **Rubinstein JT**, Wilson BS, Finley CC, Abbas PJ. Pseudospontaneous activity: stochastic independence with electrical stimulation of the auditory nerve. *Hearing Research*, 127, 108-118, 1999.
17. Miller CA, Abbas PJ, Robinson BK, **Rubinstein JT**, Matsuoka AJ. Electrically evoked single-fiber action potentials from cat: responses to monopolar, monophasic stimulation. *Hearing Research*, 130 (1-2) 197-218, 1999.
18. **Rubinstein JT**, Parkinson WS, Tyler RS, Gantz BJ. Residual speech recognition and cochlear implant performance: effects of implantation criteria. *American Journal of Otolaryngology*, 20 (3)445-452, 1999.
19. Gantz, BJ, **Rubinstein JT**, Gidley P, Woodworth G. Surgical management of Bell's Palsy. *Laryngoscope* 109:1177-1188,1999
20. **Rubinstein JT**, Miller CA. How do cochlear prostheses work? *Current Opinion in Neurobiology* 9:399-404,1999.
21. Miller CA, Abbas PJ, **Rubinstein JT**. An empirically based model of the electrically evoked compound action potential. *Hearing Research*, 135 (1-2)1-18,1999.
22. Gidley PW, Gantz BJ, **Rubinstein JT**. Facial nerve grafts - from

- cerebellopontine angle and beyond. *American Journal of Otology* 20:781-788, 1999.
23. **Rubinstein JT**, Bauman NM. Management of Meniere's Disease in Children. *Meniere's Disease 1999--Update*, 409-418, 1999.
  24. Vannier MW, Wang G, Skinner MW, **Rubinstein JT**. New X-ray imaging strategies – Implications for cochlear implantation. *Review of Progress in Qualitative Nondestructive Evaluation* 18(B): 1569-1574, 1999.
  25. Ali T, **Rubinstein, JT**. Rheumatoid arthritis of the temporomandibular joint with herniation into the external auditory canal. *Annals of Otology, Rhinology, and Laryngology* 109 (2) 177-179, 2000.
  26. White JA, **Rubinstein JT**, Kay AR. Intrinsic noise in neurons. *Trends in Neuroscience* 23:131-137, 2000.
  27. Tyler RS, **Rubinstein JT**, Teagle H, Kelsay D, Gantz BJ. Pre-lingually deaf children can perform as well as post-lingually deaf adults using cochlear implants. *Cochlear Implants International* 1 (1), 39-44, 2000.
  28. Yoo SK, Wang G, **Rubinstein JT**, Skinner M, Vannier M. Three-dimensional modeling and visualization of the cochlea on the internet. *IEEE Transactions on Information Technology in Biomedicine* 412, 144-151, 2000.
  29. Yang S, Wang G, Skinner MW, **Rubinstein JT**, Vannier MW. Localization of dense markers in radiographs. *Medical Physics* 27 (4), 775-777, 2000.
  30. Wang G, Skinner MW, **Rubinstein JT**, Howard MA, Vannier MW: Digital X-ray stereophotogrammetry for cochlear implantation. *IEEE Transactions on Biomedical Engineering*, 47 (8) 1120-1130, 2000.
  31. Matsuoka AJ, Abbas PJ, **Rubinstein JT**, Miller CA. The neuronal response to electrical constant-amplitude pulse train stimulation: evoked compound action potential recordings. *Hearing Research*, 149, 115-128, 2000.
  32. Matsuoka AJ, Abbas PJ, Miller CA, **Rubinstein JT**. The neuronal response to electrical constant-amplitude pulse train stimulation: additive Gaussian noise. *Hearing Research*, 149 , 129-137, 2000.

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33. Gantz B, **Rubinstein J**, Tyler R, Teagle HFB, Cohen N, Waltzman S, Miyamoto R, Kirk K. Long-term results of cochlear implants in children with residual hearing. *Ann Otol Rhinol Laryngol*, 109 (12), 33-36, 2000.
34. Tyler RS, Kelsay DMR, Teagle HFB, **Rubinstein JT**, Gantz BJ, Christ AM. Seven year speech perception results and the effects of age, residual hearing and preimplant speech perception in prelingually deaf children using the nucleus and clarion cochlear implants. *Adv Oto-Rhino-Laryngology* 57, 305-310, 2000.
35. Tyler RS, Parkinson A, Wilson B, Parkinson W, Lowder M, Witt S, **Rubinstein J**, Gantz B. Evaluation of different choices of  $n$  in an  $n$ -of- $m$  processor for cochlear implants. *Adv Oto-Rhino-Laryngology* 57, 311-315, 2000.
36. Yoo SK, Wang G, **Rubinstein JT**, Vannier MW. Three-dimensional geometric modeling of the cochlea using helico-spiral approximation. *IEEE Transactions on Biomedical Engineering* 47 (10) 1392-1402, 2000
37. Perry BP, **Rubinstein JT**. Imaging case study of the month: meningitis due to acute otitis media and arachnoid granulations. *Annals of Otolaryngology, Rhinology & Laryngology*, 109, 877-879, 2000
38. Miller CA, Robinson BK, **Rubinstein JT**, Abbas PJ, Samuelson CR Auditory nerve response to monophasic and biphasic electric stimuli. *Hearing Research* 151, 79-94, 2001.
39. Matsuoka AJ, **Rubinstein JT**, Abbas PJ, Miller CA. The effects of interpulse interval on stochastic properties of electrical stimulation models and measurements. *IEEE Transactions on Biomedical Engineering*, Vol 48, No 4, 416-424, April 2001.
40. Perry BP, Gantz BJ, **Rubinstein JT**. Acoustic neuromas in the elderly. *Otology & Neurotology* Vol 22, No 3, 389-391, May, 2001.
41. Lustig, LR, Arts HA, Brackmann DE, Francis HF, Molony T, Megerian CA, Moore GF, Moore KM, Morrow T, Postic W, **Rubinstein JT**, Srireddy S, Syms III, CA, Takahashi G, Vernick D, Wackym PA, Niparko JK. Hearing rehabilitation using the BAHA bone anchored hearing aid: results in 40 patients. *Otology & Neurotology* Vol 22, No 3, 328-334, May 2001.
42. **Rubinstein JT**, Miller CA, Mino H, Abbas PJ. Analysis of monophasic and biphasic electrical stimulation. *IEEE Transactions on Biomedical Engineering* 48(10): 1065-1070, 2001.

43. Gantz, BJ, **Rubinstein JT**, Gidley P, Woodworth G. Results of Surgical Decompression for Bell's Palsy. Update on Facial Nerve Disorders, AAOHNS Monograph, Alexandria, VA, pp. 181-193, 2001.
44. Yoo SK, Wang G, **Rubinstein JT**, Vannier MW. Semi-automatic segmentation of the cochlea using real-time volume rendering and regional adaptive snake modeling. Journal of Digital Imaging 14(4): 173-181, 2001
45. Tyler RS, Gantz GJ, **Rubinstein JT**, Wilson BS, Parkinson AJ, Wolaver A, Preece JP, Witt S, Lowder MW. Three-month results with bilateral cochlear implants. Ear & Hearing 23 (supplement): 80-89, 2002.
46. Gantz BJ, Tyler RS, **Rubinstein JT**, Wolaver A, Lowder M, Abbas P, Brown C, Hughes M, Preece JP. Binaural cochlear implants: results of subjects implanted bilaterally during the same operation. Otology & Neurotology 23(2): 169-180, 2002.
47. Jiang M, Wang G, Skinner MW, **Rubinstein JT**, Vannier MW. Blind deblurring of spiral CT image: comparative studies on edge to noise ratios. Medical Physics 29(5): 821-829, 2002.
48. Tyler RS, Preece JP, Wilson BS, **Rubinstein JT**, Parkinson AJ, Wolaver AA, Gantz BJ. Distance, localization and speech perception pilot studies with bilateral cochlear implants. Cochlear Implants – An Update, 517-522, 2002.
49. Mino H, **Rubinstein JT**, White JA. Comparison of algorithms for the simulation of action potentials with stochastic sodium channels. Annals of Biomedical Engineering 30(4): 578-587, 2002.
50. **Rubinstein JT**. Pediatric cochlear implants: prosthetic hearing and language development. by invitation to The Lancet 360: 483-85, 2002.
51. **Rubinstein JT** and Turner CW. A novel acoustic simulation of cochlear implant hearing: effects of temporal fine structure. First International IEEE EMBS Conference on Neural Engineering, IEEE press, 142-145, 2003.
52. Chen AF, Samy RF, Kirby P, Gantz BJ and **Rubinstein JT**. Neuroepithelial Cysts of the Middle Ear. Annals of Otology, Rhinology and Laryngology 112: 356-360, 2003.

53. **Rubinstein JT**, Tyler RS, Wolaver A and Brown CJ. Electrical suppression of tinnitus with high-rate pulse trains. *Otology & Neurotology*, 24: 478-485, 2003.
54. Hong RS, **Rubinstein JT**, Wehner D, Horn D. Dynamic range enhancement for cochlear implants. *Otology & Neurotology*, 24: 590-595, 2003.
55. **Rubinstein JT** and Della Santina CC. Analysis of a biophysical model for vestibular prosthesis research. *Journal of Vestibular Research* 12(2-3): 69-76, 2003.
56. Jiang M, Wang G, Skinner MW, **Rubinstein JT**, Vannier MW. Blind deblurring of spiral CT images. *IEEE Transactions on Medical Imaging* 22(7): 837-845, 2003.
57. **Rubinstein JT**, Hong RS. Signal coding in cochlear implants: Exploiting stochastic effects of electrical stimulation. *Annals of Otology, Rhinology and Laryngology* 112(suppl 191): 14-19, 2003.
58. Goma NA, **Rubinstein JT**, Lowder MW, Tyler RS, Gantz BJ. Residual speech perception and cochlear implant performance in postlingually deafened adults. *Ear & Hearing* 24(6): 539-544, 2003.
59. Hong RS and **Rubinstein JT**. High-rate conditioning pulse trains in cochlear implants: Dynamic range measures with sinusoidal stimuli. *Journal of the Acoustical Society of America* 114(6): 3327-3342, 2003.
60. Christensen GE, He J, Dill JA, **Rubinstein JT**, Vannier M, and Wang G. Automatic Measurement of the Labyrinth Using Image Registration and a Deformable Inner Ear Atlas. *Academic Radiology* 10(9): 988-99, 2003.
61. Mino H, **Rubinstein JT**, Miller CA, Abbas PJ. Effects of electrode-to-fiber distance on temporal jitter with electrical stimulation. *IEEE Transactions on Biomedical Engineering* 51(1): 13-20, 2004.
62. Yoo SK, Wang G, Collison F, **Rubinstein JT**, Vannier MW, Kim HJ, Kim NH. Three-dimensional localization of cochlear implant electrodes using epipolar stereophotogrammetry. *IEEE Transactions on Biomedical Engineering* 51(5): 838-846, 2004.
63. **Rubinstein JT**. How cochlear implants encode speech. *Current Opinion in Otolaryngology* 12(5): 444-448, 2004.

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64. Runge-Samuels CL, Abbas PJ, **Rubinstein JT**, Miller CA, Robinson BK. Response of the auditory nerve to sinusoidal electrical stimulation: effects of high-rate pulse trains. *Hearing Research* **194**(1-2):1-13, 2004.
65. **Rubinstein, JT**. An introduction to the biophysics of the eCAP. *International Journal of Audiology*, 43: suppl 1: S3-9, 2004.
66. Wang G, Zhao S, Yu H, Miller CA, Abbas PJ, Gantz BJ, Lee SW, **Rubinstein JT**. Design, analysis and simulation for development of the first clinical micro-CT scanner. *Acad Radiol. Apr*;12(4):511-25, 2005.
67. Hong RS and **Rubinstein JT**. Conditioning pulse trains in cochlear implants: Effects on loudness growth. *Otology & Neurotology* 27(1):50-6, 2006.
68. Meyer, TA, Canty, PA, Wilkinson, EP, Hansen, MR, **Rubinstein, JT**, Gantz, BJ. Small Acoustic Neuromas: Watch and Wait versus Surgical Excision. *Otology & Neurotology* 27(3):380-392, 2006.
69. Mino H, **Rubinstein JT**. Effects of neural refractoriness on spatio-temporal variability in neural spike initiations with electrical stimulation. *IEEE Transactions on Neural Systems and Rehabilitation Engineering* 14(3): 273-80, 2006.
70. White JA, **Rubinstein JT** and Mino H. Implementation Issues in Approximate Methods for Stochastic Hodgkin-Huxley models. *Ann Biomed Eng.* 35(2):319, 2007.
71. Drennan WR, Won JH, Dasika VK and **Rubinstein JT**. Effects of temporal fine-structure on lateralization and the BILD of spondees in babble and steady-state noise. *JARO* 8(3): 373-83, 2007.
72. Ruffin CV, Tyler RS., Witt SA, Dunn CC, Gantz BJ, **Rubinstein JT**. Long-term Performance of Clarion 1.0 Cochlear Implant Users. *Laryngoscope* 117(7): 1183-90, 2007.
73. Wilkinson, EP, Meyer, TA and **Rubinstein, JT**. Spontaneous otogenic pneumocephalus managed with the Middle Fossa Approach. *Acta Otolaryngologica* 127(8): 892-6, 2007.
74. Won JH, Drennan WR and **Rubinstein JT**. Spectral ripple resolution and speech perception in noise by cochlear implant listeners. *JARO* 8(3): 384-92, 2007.

75. Nimmons GL, Kang RS, Drennan WR, Longnion J, Ruffin C, Worman T, Yueh B, and **Rubinstein JT**. Clinical Assessment of Music Perception in Cochlear Implant Listeners, *Otology & Neurotology* 29: 149-155, 2008.
76. Drennan W, Longnion JK, Ruffin C, **Rubinstein JT**. Discrimination of Schroeder-Phase Harmonic Complexes by Cochlear Implant Users. *JARO* 9: 138-149, 2008.
77. Won JH, Schimmel S, Drennan WR, Souza PE, Atlas L and **Rubinstein JT**. Improving performance in noise for hearing aids and cochlear implants using coherent modulation filtering. *Hearing Research* 239: 1-11, 2008.
78. Drennan WR and **Rubinstein JT**. Music perception in cochlear implant users and its relationship with psychophysical capabilities, *J Rehabil Res Dev.* 45(5): 779-790, 2008.
79. Tyler RS, **Rubinstein J**, Pan T, Chang SA, Gogel S, Gehring A, Coelho C. Electrical Stimulation of the Cochlea to Reduce Tinnitus. *Seminars in Hearing* 29(4): 327-333, 2008.
80. Dasika VK, Werner LA, Norton SJ, Nie K, **Rubinstein JT**. Measuring detection and reaction time in electric hearing infants and toddlers using an observer-based procedure, *Ear & Hearing*, 30:250-261, 2009.
81. Kang R, Nimmons GL, Drennan W, Longnion J, Ruffin C, Nie K, Won JH, Worman T, Yueh B, **Rubinstein JT**. Development and Validation of the University of Washington Clinical Assessment of Music Perception (CAMP) Test. *Ear & Hearing*, 30:411-418, 2009.
82. Friesen, LM, Tremblay, KL, Rohila, N, Wright, RA, Shannon, RV, Başkent, D, **Rubinstein, JT**. Evoked cortical activity and speech recognition as a function of the number of simulated cochlear implant channels. *Clinical Neurophys* 120:776-782, 2009.
83. Imennov N, **Rubinstein JT**. Stochastic Population Model for Electrical Stimulation of the Auditory Nerve, *IEEE Trans Biomed Engin* 56(10):2493-2501, 2009.
84. Jung KH, Cho YS, Cho JK, Park GY, Kim EU, Hong SH, Chung WH, Won JH, **Rubinstein JT**. Clinical assessment of music perception in Korean cochlear implant listeners. *Acta Otolaryngologica* 130(6):716-23, 2010.

85. Drennan WR, Won JH, Jameyson E, Nie K, **Rubinstein JT**. Sensitivity of psychophysical measures to signal processor modifications in cochlear implant users. *Hearing Research* 262(1-2):1-8, 2010.
86. Goldwyn JH, Shea-Brown E, **Rubinstein JT**. Encoding and decoding amplitude modulation via cochlear implants - a computational study. *J Computational Neuroscience* 28(3):405-424, 2010.
87. Cushing SL, Ishak G, Perkins JA, **Rubinstein JT**. Gorham Stout Syndrome of the Petrous Apex Causing Chronic Cerebrospinal Fluid Leak. *Otology & Neurotology* 31(5):789-92, 2010.
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32. **Rubinstein JT**, Wilson BS, Abbas PJ. Restoration of acoustic-like patterns of auditory nerve activity with electrical stimulation. 4<sup>th</sup> European Symposium on a Cochlear Implantation, s=Hertongenbosch, The Netherlands, 1998.
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P.J. Abbas, **J.T. Rubinstein**, C.A. Miller and A.J. Matsuoka, First Quarterly Progress Report NO1-DC-6-2111, The Neurophysiological Effects of Simulated Auditory Prosthesis Stimulation, 1997.

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Other Special Presentations

**Theses**

1. **Rubinstein, J.T.** A Microprocessor-Based Bone Mineral Analyzer [Undergraduate Thesis]. Providence RI: Brown University, 1981.
2. **Rubinstein, J.T.** Some Analysis and a Program for the Design of FIR Digital Filterbanks for Speech Recognition [Masters Thesis]. Providence RI: Brown University, 1982.

3. **Rubinstein, J.T.** Quasi-static Analytical Models for Electrical Stimulation of the Auditory Nervous System [Dissertation]. Seattle WA: University of Washington, 1988.

**Invited Presentations**

- 1991 Invited Speaker; Asilomar Conference on Implantable Auditory Prostheses  
1993 Invited Speaker; Bryant College Conference on Cochlear Implants  
1995 Invited Speaker; Asilomar Conference on Implantable Auditory Prostheses  
1995 Chairman, Neural Modeling Session, Biomedical Engineering Society  
1996 Moderator, Cochlear Implant Session, Association for Research in Otolaryngology  
1996 Invited speaker, Bloedel Hearing Research Center, University of Washington  
1997 Invited speaker, 5th International Cochlear Implant Conference, New York, NY  
1997 Invited speaker, Asilomar Conference on Implantable Auditory Prostheses, Pacific Grove, CA  
1998 International Faculty, First International Symposium & Workshop on Objective Measures in Cochlear Implants, Nottingham, U.K.  
1999 Invited speaker, Asilomar Conference on Implantable Auditory Prostheses, Pacific Grove, CA  
2000 Invited speaker, CI 2000, 6<sup>th</sup> International Cochlear Implant Conference, Miami Beach, Florida  
2000 Invited speaker, 5<sup>th</sup> European Symposium on Paediatric Cochlear Implantation, Antwerp, Belgium  
2000 Invited speaker, World Congress on Medical Physics & Biomedical Engineering, Chicago, IL  
2000 Invited Speaker, 45<sup>th</sup> Japan Audiological Society Meeting, Nagoya, Japan  
2001 Moderator, 8<sup>th</sup> Symposium on Cochlear Implants in Children, Los Angeles, CA  
2001 Moderator, Second International Symposium & Workshop on Objective Measures in Cochlear Implants, Lyon, France  
2001 Visiting Professor, Hospital of the University of Geneva, Geneva Switzerland  
2001 Co-Chair, Asilomar Conference on Implantable Auditory Prostheses, Pacific Grove, CA  
2001 Visiting Professor, Department of Otolaryngology, Johns Hopkins School of Medicine, Baltimore, MD  
2002 Outreach Faculty, Wireless Integrated MicroSystems Engineering Research Center, University of Michigan, Ann Arbor, MI  
2002 Visiting Professor, First International Temporal Bone Dissection Course, Samsung Medical Center, Sungkyunkwan School of Medicine, Seoul, Korea  
2002 Panel on the Future of Cochlear Implants in Children. Triological Society Annual Meeting, Boca Raton, FL  
2002 Invited Speaker, Prentice Bloedel Day, Department of Otolaryngology, University of Washington, Seattle, WA

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- 2002 Visiting Professor, Department of Otolaryngology, Mount Sinai School of Medicine, New York, NY
- 2002 Invited Speaker, Symposium on frontiers of organ and tissue replacement, American Society for Artificial Internal Organs, New York, NY
- 2002 International Advisory Member, 7<sup>th</sup> International Cochlear Implant Conference, Manchester, UK
- 2002 Visiting Professor, Department of Otolaryngology, University of Cincinnati, Cincinnati, OH
- 2002 Featured Speaker, Research Study Club, Los Angeles County Otolaryngology Society
- 2003 Keynote Speaker, NYU Cochlear Implant Course, Department of Otolaryngology, New York University, NY
- 2002 Invited panel on artificial organs, Third Annual Conference on Regenerative Medicine & DNA Therapies, Washington, D.C.
- 2003 Faculty Board, 4th International Symposium on Electronic Implants in Otology & Conventional Hearing Aids, Toulouse, France
- 2003 Guest speaker, American Auditory Society, Scottsdale, AZ
- 2003 Visiting Professor, Second International Temporal Bone Dissection Course, Samsung Medical Center, Sungkyunkwan School of Medicine, Seoul.
- 2003 Invited speaker, Asilomar Conference on Implantable Auditory Prostheses, Pacific Grove, CA
- 2003 Invited speaker, Research Plenary Session, Annual meeting of Self-Help for Hard of Hearing People, Atlanta, GA
- 2003 Invited Faculty, 9<sup>th</sup> Symposium on Cochlear Implants in Children, Washington, DC
- 2003 Invited speaker, Workshop on Cochlear Implants: Perception, Physiology, Models, Association for Research in Otolaryngology, Daytona Beach, FL
- 2003 Invited speaker, Symposium on Tinnitus: Mechanisms, Models, Therapy, Association for Research in Otolaryngology, Daytona Beach, FL
- 2003 Visiting Professor, Saint Louis University / Washington University combined grand rounds, Saint Louis, MO.
- 2003 Visiting Professor, Department of Otolaryngology, University of Texas, Houston, Guest Speaker, Houston Society of Otolaryngology.
- 2003 Guest Faculty, Third International Symposium on Objective Measures in Cochlear Implantation, Department of Otolaryngology, University of Michigan, Ann Arbor, MI.
- 2003 Invited Lecturer, Department of Phonetics and Linguistics, University College London, UK.
- 2003 Twilight Lecture, The Ear Foundation, University of Nottingham, UK.
- 2003 Keynote Speaker, Asia-Pacific Symposium on Cochlear Implants, Taipei, Taiwan.

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- 2004 International Advisory Panel, VIII International Cochlear Implant Conference, Indianapolis, IN.
- 2004 International Faculty, 7<sup>th</sup> European Symposium on Paediatric Cochlear Implantation, Geneva, Switzerland
- 2004 Guest Speaker, The Colorado Audiology-Otology Conference, Vail, CO
- 2004 Invited Lecturer, MRC Cognition and Brain Sciences Unit, University of Cambridge, UK
- 2004 Visiting Professor, Laboratory of Experimental ORL, University of Leuven, Belgium
- 2004 Guest Speaker, 204<sup>th</sup> General Meeting of the Netherlands Union of Otolaryngology, Nieuwegein, Netherlands
- 2004 Moderator, Research Forum, American Academy of Otolaryngology – Head and Neck Surgery, New York, NY
- 2004 Visiting Professor, Third International Temporal Bone Dissection Course, Samsung Medical Center, Sungkyunkwan School of Medicine, Seoul
- 2004 Guest Speaker, 2<sup>nd</sup> International Symposium on Advanced Technology for Recovery of Human Sensibility, Kyungpook University, Daegu, Korea.
- 2004 Guest Professor, University of Michigan Temporal Bone Dissection Course, Ann Arbor, MI
- 2004 Guest Speaker, Hearing, Balance and Chemical Senses Seminar, Kresge Hearing Research Institute, Ann Arbor, MI
- 2005 Guest Speaker, The Colorado Audiology-Otology Conference, Vail, CO
- 2005 Keynote Speaker, Frontiers in Hearing, Breckenridge, CO
- 2005 Guest Professor, Leiden University Cochlear Implant Course, The Netherlands
- 2005 International Faculty, 5<sup>th</sup> Asia Pacific Symposium on Cochlear Implant and Related Sciences, Hong Kong.
- 2006 Visiting Professor, Department of Otolaryngology, University of Florida, Gainesville.
- 2006 Guest Speaker, The Colorado Audiology-Otology Conference, Vail, CO
- 2006 Visiting Professor, Department of Otolaryngology, University of Pennsylvania, Philadelphia.
- 2006 Guest Speaker, Neuroengineering Now, Department of Bioengineering, University of Texas, Dallas, TX
- 2006 Visiting Professor, Osaka University Department of Otolaryngology, Osaka, Japan
- 2006 Guest Speaker, Second Annual Cochlear Implant Centres Group Education Day, Sunnybrook Health Sciences Centre, Toronto, Canada
- 2007 Guest Professor, Leiden University Cochlear Implant Course, The Netherlands
- 2007 Guest Speaker, The Colorado Audiology-Otology Conference, Vail, CO
- 2007 Howard P House Memorial Lecture, Pacific Coast Oto-Ophthalmologic Society, Oahu, HI
- 2007 Visiting Professor, Fourth International Temporal Bone Dissection Course, Samsung Medical Center, Sungkyunkwan School of Medicine, Seoul

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- 2007 Guest Professor, Updates in Otology & Neurotology, Cesme, Turkey
- 2007 International Faculty, Asia Pacific Symposium on Cochlear Implant and Related Sciences, Sydney, Australia
- 2008 Keynote Speaker, 2<sup>nd</sup> International Music and Cochlear Implant Symposium, University Hospital of Zurich, Switzerland
- 2008 Guest Professor, Leiden University Cochlear Implant Course, The Netherlands
- 2008 Guest Speaker, The Colorado Audiology-Otology Conference, Vail, CO
- 2008 Visiting Professor, Fifth International Temporal Bone Dissection Course, Samsung Medical Center, Sungkyunkwan School of Medicine, Seoul, Korea
- 2008 Keynote Speaker, 6<sup>th</sup> Inner Ear Disease and Cochlear Implant Symposium, Izmir Teaching and Research Hospital, Kusadasi, Turkey
- 2009 Guest Translational Research Lecture, American Auditory Society, Scottsdale, AZ
- 2009 Guest Professor, Leiden University Cochlear Implant Course, The Netherlands
- 2009 Guest Speaker, The Colorado Audiology-Otology Conference, Vail, CO
- 2009 Invited Speaker, Nemours Cochlear Implant Symposium, Al duPont Hospital for Children, Wilmington, DE
- 2009 Invited Speaker, Conference on Implanted Auditory Protheses, Lake Tahoe, CA
- 2009 International Faculty, Asia Pacific Symposium on Cochlear Implant and Related Sciences, Singapore
- 2010 Guest Speaker, The Colorado Audiology-Otology Conference, Vail, CO
- 2010 International Otologist, Frontiers of Otolaryngology, University of Melbourne, Australia
- 2010 Guest Professor, Leiden University Cochlear Implant Course, The Netherlands
- 2010 Distinguished speaker, House Ear Institute, Los Angeles
- 2010 Consulting speaker, IESLab, Ltd, Jinan, China
- 2010 Guest Professor, Dept of Otolaryngology, Miyazaki University, Japan
- 2010 Invited Speaker, Sixth International Symposium on Meniere's disease, Kyoto, Japan
- 2010 International Faculty, 7<sup>th</sup> Inner Ear and Cochlear Implantation Symposium, Bodrum, Turkey
- 2011 Guest Speaker, The Colorado Audiology-Otology Conference, Vail, CO
- 2011 Guest Professor, Leiden University Cochlear Implant Course, The Netherlands
- 2011 Holy Hour Speaker, Dept ExpORL, Katholieke Universiteit Leuven, Belgium
- 2011 Willard Fee Lecture, Dept of Otolaryngology, Stanford University, Stanford, CA
- 2011 Keynote speaker, Korean Otological Society, Jeong-Sun, Korea
- 2011 Plenary speaker, 8<sup>th</sup> Asia-Pacific Symposium on Cochlear Implant, Daegu, Korea
- 2011 Visiting professor, Samsung Medical Center, Seoul, Korea
- 2012 Guest Professor, Leiden University Cochlear Implant Course, The Netherlands
- 2012 Guest surgeon, Xijing Hospital, Xi'an, China
- 2012 Keynote address, 7<sup>th</sup> International Symposium on Objective Measures in Auditory Implants, Amsterdam, Netherlands

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- 2012 International Faculty, 8<sup>th</sup> Inner Ear and Cochlear Implantation Symposium, Cappadocia, Turkey
- 2012 Guest speaker, 16<sup>th</sup> International Symposium on Audiological Medicine, Beijing
- 2012 Seminar speaker, Weldon School of Biomedical Engineering, Purdue University, West Lafayette, IN
- 2013 Visiting Professor, Department of Otolaryngology, Bnai Zion Medical Center, Technion, Haifa, Israel
- 2013 Keynote speaker, Leiden University Cochlear Implant Course, The Netherlands.
- 2013 Schindler Lecture, UC San Francisco Department of Otolaryngology-HNS.
- 2014 Visiting Surgeon, Global Foundation for Children with Hearing Loss, Childrens' Hospital #1, Ho Chi Minh City, Hanoi Nat'l Childrens' Hospital, Vietnam
- 2014 Keynote speaker, Leiden University Cochlear Implant Course, The Netherlands.
- 2014 Guest Faculty, Cochlear Colloquium, Mumbai, India
- 2015 Keynote speaker, Asia Pacific Symposium on Cochlear Implants, Beijing, China
- 2015 Invited speaker, Acoustical Society of America, Pittsburgh, PA
- 2016 Wilson TS Wang Visiting Professor, Department of Otolaryngology, Chinese University of Hong Kong
- 2016 Invited Speaker, Barany Society, Seoul, Korea
- 2016 Visiting Professor, Department of Otolaryngology, UT Southwestern, Dallas, TX.
- 2017 Robert H Mathog MD Memorial Lectureship, Department of Otolaryngology - HNS, Wayne State University, Detroit
- 2017 Schuknecht Lecture, Massachusetts Eye & Ear, Harvard Medical School, Boston
- 2017 John Niparko Lecture, Department of Otolaryngology, University of Southern California, Los Angeles
- 2018 Guest speaker, The Politzer Society, Las Palmas de Gran Canaria, Spain.
- 2018 Guest faculty, Cochlear China surgeons advisory board, Beijing, China

Patents Received

1. **Jay T Rubinstein.** Pseudospontaneous Neural Stimulation System and Method. U.S. Patent No. 6,078,838. 6/20/00.
2. **Jay T Rubinstein,** Carolyn J Brown, Richard S Tyler, Paul J Abbas. System and Method for Application of Pseudospontaneous Neural Stimulation. U.S. Patent No. 6,295,472, 9/25/01.
3. **Jay T Rubinstein,** Carolyn J Brown, Richard S Tyler. System and Method for Diagnosing and/or Reducing Tinnitus. U.S. Patent No. 6,631,295, 10/7/03.
4. **Jay T Rubinstein,** Blake S Wilson. Speech Processing System and Method using Pseudospontaneous Stimulation. U.S. Patent No. 6,907,130, 6/14/05.
5. Kaibao Nie, Les Atlas, **Jay Rubinstein,** Xing Li, Charles Clark. Enhanced Signal Processing for Cochlear Implants. U.S. Patent No. 8,019,431, 9/13/11
6. Frank Risi, Colin Irwin, **Jay T Rubinstein,** Felipe Santos and James O Phillips. Vestibular stimulation Device. U.S. Patent No. 9,089,692, 7/28/15

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Patents Applied For

1. **Jay Rubinstein**, Kaibao Nie, Steven Bierer, James Phillips, Leo Ling  
Electrically-evoked Vestibular Compound Action Potentials to Guide Placement  
and Programming of a Vestibular Neural Stimulator, 2009
2. **Jay Rubinstein**, James Phillips, Albert Fuchs, Leo Ling, Kaibao Nie, Steven  
Bierer, Vestibular Implant Stimuli for the Treatment of Meniere's Disease, 2009
3. **Jay Rubinstein**, William Harrison. Electrodes for the Treatment of Tinnitus,  
2008
4. **Jay Rubinstein**, William Harrison. Systems and Methods for the Treatment of  
Tinnitus, 2008

Areas of Research

Functional electrical stimulation of the inner ear  
Treatment of hearing loss, tinnitus and vestibular dysfunction  
High performance computing for neural modeling

Grants and Contracts

1995-97	San Diego Supercomputer Center. Biophysical Model of Spiral Ganglion Cell and Auditory Nerve Principal Investigator	200 Cray hours quarterly
1996-99	The Whitaker Foundation. Biophysical Model of Type - I Spiral Ganglion Cells Principal Investigator	\$210,000
1996-98	NIH, Shannon Award, NO1-R55 DC/ODO2948-01. Comparative Biophysical Model of Spiral Ganglion Cells Principal Investigator	\$100,000
1996-99	National Institutes of Health, Contract No. N01-DC-6-2111. The Neurophysiological Effects of Simulated Auditory Prosthesis Stimulation Co-Principal Investigator	\$852,000
1997	National Institutes of Health, SBIR R43DC03505 Cochlear Electrode with High Channel Selectivity Subcontract PI	\$99,550
1998	National Institutes of Health Cochlear Implant Conference Co-Investigator (Shannon, PI)	\$25,000
1999-00	Braintronics, Inc.	

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	Tinnitus Suppression with Electrical Stimulation	
	Principal Investigator	\$150,000
1999-04	National Institutes of Health 1 R01 DC03590	
	Spiral CT for Cochlear Implantation	
	Investigator (Wang, PI)	\$1,159,301
1999-02	National Institutes of Health Contract No. NIH-DC-98-14	
	The Neurophysiological Effects of Simulated Auditory Prosthesis Stimulation	
	Co-Principal Investigator	\$1,116,095
1999-02	National Institutes of Health Contract No. NIH-DC-98-11	
	Effects of Remaining Hair Cells on Cochlear Implant Function	
	Co-Investigator (Abbas, PI)	\$879,110
2000-03	Tinnitus Research Consortium	
	Electrical Suppression of Tinnitus	
	Principal Investigator	\$300,000
2001	National Institutes of Health 1 R13 DC005041-01	
	2001 Conference on Implantable Auditory Prostheses	
	Conference Co-Chair (Shannon, PI)	\$30,000
2001-06	National Institutes of Health P50	
	Iowa Cochlear Implant Center IV	
	Co-Director (Gantz, PI)	\$10,823,000
2002-06	National Institutes of Health Contract No. NIH-DC-98-11	
	Effects of Remaining Hair Cells on Cochlear Implant Function	
	Co-Investigator (Abbas, PI)	\$1,522,412
2002-03	Braintronics, Inc	
	Ear Implant for Tinnitus Suppression	
	Principal Investigator	\$250,000
2002	Advanced Bionics Inc.	
	Dynamic range with high-rate conditioning stimuli	
	Principal Investigator	\$30,000
2003	Advanced Bionics Inc.	
	Frequency discrimination with high-rate conditioning stimuli	
	Principal Investigator	\$30,000
2004-08	National Institutes of Health R01 DC05972	
	Randomized Trial of Tinnitus Retraining Therapy	
	Investigator (Tyler, PI)	\$1,768,575
2006	National Organization for Hearing Research Foundation	
	Measuring and improving hearing in infants with cochlear implants	
	Role: Mentor (Dasika, PI)	\$20,000
2005-10	National Institutes of Health R01 DC007525	
	Optimized Conditioned Processing for Cochlear Implants	
	Principal Investigator	\$1,905,126
2006-11	National Institutes of Health R13 DC006616	

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	Building the Next Generation of Clinical Researchers - American Auditory Society	
	Role: Co-Investigator (Gorga, PI)	\$133,579
2006-11	National Institutes of Health DC-05-0011 (Phillips, PI)	
	Neurophysiological Studies of Electrical Stimulation for the Vestibular Nerve Investigator	\$2,831,646
2006-07	Cochlear Corporation	
	Validation of the UW CAMP music test for cochlear implant recipients.	
	Role: PI	\$30,000
2007-08	Advanced Bionics Corporation	
	Validation of the UW CAMP music test for cochlear implant recipients	
	Role: PI	\$15,000
2006-08	Cochlear Corporation	
	Clinical Trial of the Nucleus Hybrid Cochlear Implant	
	Role: PI	\$7,500
2008	National Institutes of Health F32 DC008238 (Dasika, PI)	
	The development of sensitivity to electrical stimulation with cochlear implants.	
	Role: Mentor	\$58,898
2009-11	National Institutes of Health F31 DC009755 (Won, PI)	
	Psychophysics of speech processor modifications in cochlear implants.	
	Role: Mentor	\$68,836
2008-09	Cochlear Corporation	
	Clinical Trial of the Nucleus Hybrid S12 Cochlear Implant	
	Role: PI	\$7,500
2009-11	Wallace Coulter Foundation	
	Clinical Feasibility of a Vestibular Neurostimulator	
	Role: PI	\$212,000
2009-11	National Institutes of Health F31 DC010306	
	A model-based approach for optimizing cochlear implant stimulation	
	Role: Co-mentor (Goldwyn, PI)	\$68,836
2010	University of Washington Technology Gap Innovation Fund	
	Improving speech and music perception with cochlear implants	
	Role: Investigator (Nie, PI)	\$50,000
2009-11	National Institutes of Health F31 DC010309 (Faulkner, PI)	
	Auditory Training to Improve Spectral Resolution in Cochlear Implant Listeners	
	Role: Co-mentor	\$41,000
2010-12	National Institutes of Health F32 DC011431 (Jones, PI)	
	Modeling spectral-ripple discrimination by cochlear implant users	
	Role: Mentor	\$80,000
2010-15	National Institutes of Health R01 DC010148 (Drennan, PI)	
	Improved analysis of cochlear implant sound processing	

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	Role: Investigator	\$1,875,000
2011	ITHS/National Primate Research Center (Phillips, PI) Vestibular Prosthesis for Bilateral and Uncompensated Unilateral Loss	
	Role: Co-investigator	\$75,000
2011-14	Kranwinkle Family Clinical Feasibility of a Vestibular Implant for Meniere's disease	
	Role: PI	\$1,004,000
2013-14	American Otologic Society (Horn, PI) Spectral and Temporal Resolution in Children with Cochlear Implants	
	Role: Co-mentor	\$80,000
2014-15	Wallace Coulter Foundation (Atlas, PI) Tonality in Cochlear Implants	
	Role: Investigator	\$100,000
2014-19	National Institutes of Health R01 DC014002 Optimization of a human vestibular implant	
	Role: PI	\$2,961,610
2014-19	National Institutes of Health K23 DC013055 (Horn, PI) Spectral and Temporal Resolution in Children with Cochlear Implants	
	Role: Co-Mentor	\$1,151,530
2014	Anderson Family Operating support for the Bloedel Center	
	Role: PI	\$100,000
2014-	Bill and Melinda Gates Foundation Bloedel Minigrant Endowment	
	Role: PI	\$500,000
2015-16	Wallace Coulter Foundation (Atlas, PI) Tonality in Cochlear Implants	
	Role: Investigator	\$100,000
2018-21	Department of Defense DM170556OD (Drennan, PI) Early Detection of Noise-induced Hearing Loss	
	Role: Investigator	\$1,568,560

**IV. SERVICE**

Professional Affiliations

1980-	IEEE Engineering in Medicine and Biology Society
1986-	Association for Research in Otolaryngology
1990-	American Academy of Otolaryngology-Head and Neck Surgery
1992-94	Triological Society Resident Fellow
1996-	American Neurotology Society - Associate Member
1999-	American Auditory Society

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- 2002- American Otological Society
- 2006- IEEE Senior Member
- 2006- Collegium ORLAS
- 2007-09 President-elect and Program Chair, American Auditory Society
- 2008-11 Council, Association for Research in Otolaryngology
- 2009-10 President, American Auditory Society
- 2009- Vice-President, CORLAS-US group
- 2012-13 President-elect, Association for Research in Otolaryngology
- 2013-14 President, Association for Research in Otolaryngology
- 2014-15 Past-President, Association for Research in Otolaryngology

Collegiate, University and National Committees

- 1992-94 Graduate Medical Education Committee, Massachusetts Eye and Ear Infirmary
- 1994-00 Committee on Implantable Hearing Devices, American Academy of Otolaryngology--Head and Neck Surgery
- 1995- Scientific Advisory Council, NIDCD National Temporal Bone, Hearing and Balance Pathology Resource Registry
- 1996 Steering Committee, 1997 Asilomar Conference on Implantable Auditory Prostheses
- 1996 Ad Hoc NIH Site Visitor
- 1997 IAIMS Task Force, The University of Iowa
- 1997- American Neurotology Society Research Committee
- 1997- College of Medicine Research Committee
- 1997 Ad Hoc member NIH Hearing Research Study Section
- 1997 Ad Hoc member NIH Sensory Disorders SBIR Study Section
- 1998 Ad Hoc member NIH Hearing SBIR Study Section
- 1999 Ad Hoc member NIH IFCN Study Section
- 2000 Ad Hoc Member, NIH IFCN6 SBIR Study Section
- 2000 Peer reviewer, Conference of Rectors of the Austrian Universities
- 2000 NIH NINDS Special Emphasis Panel ZNS1 SRB-H(04)
- 2001 NIH NIDCD Special Emphasis Panel ZDC1 SRB-O
- 2001 Conference co-chair, Asilomar Conference on Implantable Auditory Prostheses
- 2001 Steering Committee, NIH/VA International Hearing Aid Conference
- 2001 Task Force on New Materials, American Board of Otolaryngology
- 2001 Nominating Committee, Association for Research in Otolaryngology
- 2001 Peer Reviewer, Hearing Loss Guideline Panel, New York State Department of Health
- 2002 Steering Committee, 2003 Asilomar Conference on Implantable Auditory Prostheses

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- 2002 Outreach Faculty, Wireless Integrated MicroSystems Engineering Research Center, University of Michigan, Ann Arbor, MI
- 2002 NIH NIDCD Special Emphasis Panel, ZRG1 IFCN-4(06)
- 2002 Prosthetic Clinical Management National Workgroup on Cochlear Implants, Department of Veteran Affairs
- 2002 Ad Hoc Reviewer, Swiss National Science Foundation
- 2003 NIH NIDCD Special Emphasis Panel ZDC1 SRB-O
- 2003 Ad Hoc Reviewer, Royal National Institute for the Deaf, UK
- 2003 NIH NIDCD Special Emphasis Panel ZDC1 SRB-R (42)
- 2004 Ad hoc member, NIH AUD study section
- 2005 Ad hoc member, NIH R03 study section
- 2005-09 Permanent member NIH AUD study section
- 2005-08 Government Relations Committee, ARO
- 2006 Guest examiner, American Board of Otolaryngology
- 2006-07 Program Advisory Committee, American Otologic Society
- 2007 Guest examiner, American Board of Otolaryngology
- 2007 Steering committee, Conference on Implantable Auditory Prostheses
- 2007 Ad Hoc Reviewer, US Department of Energy Retinal Prosthesis Program
- 2008 Neurotology Examiner, American Board of Otolaryngology
- 2008-09 Scientific Advisory Panel, NIH Roadmap Nanomedicine Initiative
- 2009 Guest Examiner, American Board of Otolaryngology
- 2010 Neurotology Examiner, American Board of Otolaryngology
- 2010 Chair, nominating committee, American Otologic Society
- 2010 Program Committee, American Otologic Society
- 2012 Program Committee, American Otologic Society
- 2012-13 President-elect, Association for Research in Otolaryngology
- 2013-14 President, Association for Research in Otolaryngology
- 2014-15 Past President, Association for Research in Otolaryngology
- 2018-22 President-Elect, The Politzer Society

Board Memberships

- 2001- Scientific Advisory Board, American Tinnitus Association
- 2002- Surgical Advisory Board, Cochlear Corporation
- 2003- Editorial Board, Otology and Neurotology
- 2003- Editorial Board, Hearing Research
- 2005-08 Associate Editor, Journal of the Association for Research in Otolaryngology
- 2004-08 Executive Board, American Auditory Society
- 2005- Board of Trustees, Listen & Talk School, Seattle, WA
- 2005- Surgical Advisory Board, Advanced Bionics Corporation
- 2006-08 Board of Trustees, Executive Committee, Northwest Lions Foundation for Sight and Hearing, Seattle, WA
- 2006-12 Chairman, Board of Trustees, Audient, LLC, Seattle, WA

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- 2008-11 Council-at-large, Association for Research in Otolaryngology
- 2008-13 Board of Directors, SightLife, LLC, Seattle, WA
- 2010-13 Board of Directors, Otology & Neurotology
- 2010-18 Research Advisory Board, American Otologic Society
- 2012-17 Board of Scientific Counselors, NIDCD
- 2015- 2017-21 NIDCD Strategic Plan Working Group
- 2017 Chair, Scientific Advisory Board, American Otologic Society

Ad Hoc Reviewer

Annals of Biomedical Engineering  
Annals of Neurology  
Annals of Otology, Rhinology & Laryngology  
American Journal of Otology  
Archives of Otolaryngology  
Audiology and Neuro-otology  
Ear and Hearing  
Hearing Research  
Hospital Physician  
IEEE Transactions on Biomedical Engineering  
Journal of Biomechanics  
Journal of Neurophysiology  
Journal of Neuroscience  
Journal of the Acoustical Society of America  
Journal of the Association for Research in Otolaryngology  
Laryngoscope  
Medical & Biological Engineering & Computing  
Nature Medicine  
Otology and Neurotology  
Science Translational Medicine  
The Lancet