

Elizabeth S. Olson

Education:

BA in Physics	May, 1981	Barnard College, Columbia University
PhD in Physics	May, 1988	Massachusetts Institute of Technology

Post-doctoral Training:

6/88 - 7/91 - Biomedical Engineering Dept., Boston University, Boston MA

8/91 - 4/92 - Biology Dept., Rutgers University, Piscataway NJ

Academic positions:

1992 - 1993 - Research Associate, Biology Dept., Rutgers Univ., Piscataway, NJ

1993 - 1995 - Visiting Assistant Professor, Physics Dept., Rutgers Univ., Newark, NJ

1996 – 2001 - Research staff and Lecturer, Physics Dept., Princeton Univ., Princeton, NJ

2001 - 2001 - Research Physicist and Lecturer, Physics Dept. Princeton Univ., Princeton, NJ

2001 – Director, Fowler Memorial Laboratory, OTO/HNS, Columbia University

2001 – 2009 - Assistant Professor, Depts. of OTO/HNS, joint appointment in Biomedical Engineering, Columbia University, New York, NY

2009 - 2018 - Associate Professor with tenure, Departments of OTO/HNS and Biomedical Engineering

2018 – Professor with tenure, Departments of OTO/HNS and Biomedical Engineering

2011 - Member of Columbia University Graduate Program in Neurobiology and Behavior

2015 - Member of Columbia Translational Neuroscience Initiative

Professional Activities:

Professional Organizations:

- ◆ President-Elect, President and Past-President of the Association for Research in Otolaryngology 2021-25
- ◆ Treasurer/Secretary of The Association for Research in Otolaryngology 2014-2017 (elected position)
 - ◆ Member of Association for Research in Otolaryngology
 - Member of Publication Committee 2010-2012.
 - Member of Finance and Investment Committee 2014 – 2017.
 - Member of Nomination Committee 2018 - 2021 (elected position)
 - ◆ Member of Acoustical Society of America

Editorial:

- ◆ Co-editor of special issue of Journal Oto-Rhino-Laryngology, Nov. 2006
- ◆ Associate Editor, Journal of the Association for Research in Otolaryngology, 2007 – 2010
- ◆ Co-editor of Proceedings of 11th International Mechanics of Hearing Workshop, 2011
- ◆ Associate Editor, Hearing Research, 2018 -

Consultative:

- ◆ Regular member of NIH AUD grant review study-section, 2002 – 2006
- ◆ Regularly review grant applications for: National Institutes of Health, National Science Foundation, DOD, national and international grant organizations in Europe and Canada.

Organizational:

- ◆ Primary organizer, Eastern Auditory Retreat 2006, 2010 & 2020
- ◆ Co-organizer, Eastern Auditory Retreat, 2003 - 2012
- ◆ Co-Chair of organizing committee, Mechanics of Hearing Conference July, 2011
- ◆ Member of organizing committee, Mechanics of Hearing Conference 2014 and 2017

Honors and Awards:

Henry A. Boorse Award in Physics - Barnard College, 1980
Phi Beta Kappa - May, 1981
Magna Cum Laude - Barnard College. May, 1981
Individual National Research Service Award 1/89 - 12/91
Visiting Professorship for Women Award (NSF) 9/93 - 8/95
Honorary President, Sino American Hospital, Song Yuan, China, 2005 – 2007
President-Elect, President and Past-President of the Association for Research in Otolaryngology 2021-25

Departmental and University Committees:

Co-director of Biomedical Engineering Department Masters Program 2021-
Biomedical Engineering Department Graduate Committee 2004 –
Biomedical Engineering Department Public Relations Committee 2018 – 2020
Biomedical Engineering Departmental Administration Committee 2021 --
Columbia University Institutional Animal Care and Use Committee 2011-2021
Otolaryngology / Head & Neck Surgery Diversity and Inclusion Committee co-chair 2019 -
Dean's CUIMC committee to address structural racism - 2020 - 2021
OTO/HNS Departmental Representative to CUIMC Committee on Appointments and Promotions

Grants and Fellowships:

Past Grants and Fellowships:

Whitaker Health Sciences Fund Fellowship (pre-doctoral). 9/86 - 5/88
Role: PhD student, Title: "Studies on tuning properties of electroreceptors"
N.I.H. Individual National Research Service Award. 1/89 - 12/91
Role: Post-doctoral fellow, Title: "Direct measurements of active force in the cochlea."
N.S.F. Visiting Professorship for Women Award. 9/93 - 8/95
Role: PI, Title: "Development of micromachined intracochlear pressure sensor"
NIH NIDCD R29 Grant, ("First Award") 5 year award 3/96 – 2/2001
Role: PI, Title "Finding the impedance of the organ of Corti"
NIH NIDCD R01 Grant, 5 year award x 3 competitive grant periods: 2001 – 2016
Role: PI, Title "Observing auditory mechanics with pressure measurements"
Competitive supplement to above R01 grant 3 year award 2003 – 2006
Diversity supplement to above R01 grant April, 2008
Diversity supplement to above R01 grant May, 2009
NIH NIDCD R21 Grant. 2 year award beginning December, 2009
Role: PI, Title "Intracochlear measures of active cochlear mechanics in the mouse"
RISE Grant 2 year award beginning January, 2013.
Role: Co-PI with Professor Ioannis Kymissis, Title "Toward a highly spatially resolved cochlear implant with localized sensing and stimulation"
NIH NIDCD R01 Grant, 5 year award beginning 2015
Role: Co-I, Title "Intracochlear delivery of therapeutic agents across round window membrane via microneedle array"

Present Grants:

NIH NIDCD R01 Grant, beginning 2016, competitively renewed 2021 for 5 years
Role: PI, Title "Auditory mechanics and the cochlear amplifier"
Diversity supplement to above R01 grant for CUMC "Dean's Research Fellow," April 2018
NIH NIDCD R01 Grant, 5 year award beginning 2019
Role: co-PI, Title "Implantable Microphones for Fully Implantable Cochlear Implants"
USAMRAA Grant, 3 year grant beginning 2022.
Role: co-I Title: "Intracochlear Delivery of Newly Developed Gene Therapies for Preventing and Restoring Noise-Induced Hearing Loss via Novel Dual Lumen Microneedle Technology"

Private Contributions:

Emil Capita Charitable Foundation contributes regularly to the Fowler Memorial Lab
Advanced Bionics Corporation 2015: Contribution for research on implantable microphones

Teaching Experience:

1993 - 1995 - Physics Department, Rutgers University, Newark, NJ.

- ◆ Designed and taught graduate level lecture and lab course in cellular biophysics.
- ◆ Taught junior level course in applications of mathematics to physics.
- ◆ Taught computer based introductory physics laboratory.
- ◆ Supervised undergraduate summer research students.

1996 – 2001 – Physics Department, Princeton University

- ◆ Taught introductory Physics (Pre-engineering and pre-medical tracks).
- ◆ Supervised undergraduate summer research students.
- ◆ Supervised Junior research papers.

2002 – present – Columbia University

- ◆ Designed and taught/teach graduate course (Biomed.Eng.) “Sound and Hearing” (2003 – 2007, 2010,12,14,16,18,20,22).
- ◆ Co-taught graduate class “Advanced Quantitative Physiology” 2005 - 2006.
- ◆ Co-taught / teach graduate class “Computational Methods in Physiological Systems” 2007 - 2023.
- ◆ Co-taught undergraduate class “Biomedical Engineering Lab II or III” 2008-13.
- ◆ Section in graduate neuroscience course 2012.
- ◆ Section in medical student neuroscience course 2014 - 2019.
- ◆ Co-organize BME seminar 2012-2023.
- ◆ Supervised senior design group, Biomedical Engineering Dept. 2008-2009, 2011-2012, 2013-2014, 2015-2016, 2016-2017.
- ◆ Supervised masters, undergraduate and high school and medical school research projects.
- ◆ Served on Ph.D. Thesis committees from Columbia Engineering (BME and EE), Rutgers (Biology and Physics), University of Utah (Bioengineering), NYU (Neuroscience and Physiology), University of Michigan (Mechanical Engineering), Harvard (Speech and Hearing Program), McGill University, Canada (Mechanical Engineering), Erasmus University, Netherlands (Neuroscience)

◆ **Doctoral and Post-Doctoral Mentees**

Vanessa Cervantes, research fellow (MD gap-research year) 2009-2010
Currently anesthesiologist, Portland OR.

Wei Dong, Post-doc and Associate Research Scientist 2002 - 2013
Currently (2021) Research Scientist, VA Loma Linda Healthcare System
and Research Associate Professor, OTO/HNS, Loma Linda University, Loma Linda, CA
Ombeline de La Rochefoucauld, Post-doc and Associate Research Scientist 2004-2010
Currently (2021) Engineer & Head of Bordeaux Office, Imagine Optic, Bordeaux, France

Stanley Huang, BME PhD student, graduated 2011
Thesis title: “Supra-Characteristic-Frequency Response in Gerbil Auditory Nerve
Frequency Tuning Curves”
Currently (2021) Senior Sustaining Engineer, Ascensia Diabetes Care

Nwaneka Eze, Otolaryngology Doctor's Degree student, UK (I served as research supervisor)
Graduated 2009 with degree coming from University College, London
Thesis title: “Stiffness and longitudinal coupling in the cochlea”
Currently (2021) practicing Otolologist St George's NHS Foundation Trust and Croydon
University Hospital, London

- Christopher Bergevin, Post-doc, 2011-2013
Currently (2021) Associate Professor of Physics and Astronomy, York University, Toronto, Ontario, Canada
- Sushrut Kale, Post-doc and Associate Research Scientist, 2013-2016
Currently (2021) Marketing Manager, Oncology Partnerships strategy & execution at GSK pharmaceuticals.
- Steve Park, Post-doc, 2016-2017
Currently (2021) Assistant Professor of Materials Science and Engineering, Korea Advanced Institute of Science and Technology
- Mario Milazzo, Italian Engineering PhD student (I served as co-supervisor, "Tutor out of country")
Graduated 2016 from Scuola Superiore Sat'Anna, Pisa Italy
Thesis title: "Bioengineering approaches for micro-prosthetics"
Currently (2022) Assistant Professor, University of Pisa
- Nathan Lin, PhD student (co-supervised with Prof. Christine Hendon, EE) graduated 2019
Thesis title: "Fiber-optic probe and bulk-optics Spectral Domain Optical Coherence tomography systems for in vivo cochlear mechanics measurements"
Currently (2021) Optical Engineer, Inphi Corporation
- Yi Wang, PhD graduated 2019 (BME)
Thesis title: "The sensitivity of the cochlear amplifier to changes in operating conditions"
Currently (2021) Post-doc, Neural Communications lab, Tsinghua University Beijing, China.
- Mohamed Diop, Dean's Research Fellow (MD gap-research year) 2020
MS Thesis Title: "The effect of stimulation of tensor tympani in vivo on high fidelity sound transmission through the middle ear"
Currently (2020) Otolaryngology Resident, Stanford University
- Elika Fallah, PhD graduated 2021 (BME)
Thesis title: Experimental Study of Nonlinearity and Amplification in the Mammalian Cochlea (2021-2022) Post-doctoral research scientist
Currently (2022) Staff engineer, Regeneron Pharmaceuticals, Tarrytown NY
- Brian Frost, PhD candidate (EE) 2019-2024
Thesis title: Optical Coherence Tomography Techniques for Contextualizing and Reconstructing Displacement Responses in the Mammalian Cochlea
Currently (2024) Post-doctoral Research Scientist, Rockefeller University
- C. Elliott Strimbu, Post-doc 2017-2019
Currently (2021-) Associate Research Scientist, Columbia University
- Liam Gallagher, Dean's Research Fellow (MD gap-research year 2020-21)
Currently (2022) Otolaryngology Resident, University of Minnesota
- Raquel Lobo Querido, Post-doc 2020-2022
Currently (2022) Surgical Resident, Rutgers University, NJ
- Lauren Chiriboga, PhD candidate (BME) 2021-
Nicholas Waring, Dean's Research Fellow (MD gap-research year 2022-23)

Community Outreach:

- 1993 - 1995:** Organized science laboratory field trips for Newark public school students.
- 2000 - 2006:** Chair and/or participant, Riverside Elementary School "Science Day." (Princeton, NJ)
- 2003 – 2017:** Many summers. Supervise High School summer research students
These students have been co-authors on a paper (Nakul Sheth) and won science awards based on their projects in my lab (Chloe Weiser).
- 2008 – 2009:** Mott Hall Mentor: Mentor Manhattan public middle school science students.
- 2010:** Café Science speaker, Upper West Side, New York, "Waves and Amplifiers... In Your Ear"
- 2010 – 2019:** Science Mentor, Trenton NJ.
- 2010 – :** Site visitor, Medical Center Neighborhood Fund

2017 – 2021 : Organize Public Forum on Hearing & Hearing Impairment, CUMC / NY Presbyterian Hospital.

2020 – : Middle school math tutor, Common Denominator, NYC

Invited Talks, 2007 +

- 2007** Biomedical Engineering Seminar, Johns Hopkins University, Baltimore MD
- 2007** Eaton Peabody Laboratory Research Seminar, Massachusetts Eye and Ear Infirmary
- 2008** Institute for Computational Engineering and Sciences Seminar, Austin Texas
- 2009** University College London
- 2010** Café Science, New York City
- 2010** Grand Rounds, Otolaryngology Department, Hershey Medical Center, PA
- 2010** Biophysics Seminar, Rockefeller University, New York City
- 2011** Keynote Speaker, Eastern Auditory Retreat, Yale University, New Haven CT
- 2012** Gordon Conference invited talk, Bates College, Maine
- 2012** Physics Colloquium, Princeton University
- 2012** Eaton Peabody Laboratory Research Seminar, Massachusetts Eye and Ear Infirmary
- 2013** Acoustical Society of America, Montreal CA
- 2014** Otolaryngology Seminar, Stanford University
- 2015** Biomedical Engineering Seminar, University of Rochester
- 2015** Physiology Seminar, Yale University, New Haven CT
- 2016** Biomedical Engineering Seminar, City College of New York
- 2016** SIAM conference, Boston MA
- 2017** SIAM conference, Snowbird UT
- 2018** Biomedical Engineering Seminar, McGill University, Montreal CA
- 2018** SUSTech University, Shenzhen, Guangdong, China
- 2018** Otolaryngology Seminar, Washington University St. Louis
- 2019** Assoc. for Research in Otolaryngology Symposium on Optical Coherence Tomography, Baltimore
- 2019** Federation of the Asian and Oceanian Physiological Society, Kobe, Japan
- 2019** Symposium Celebrating Richard Chadwick, NIDCD, Bethesda MD
- 2019** Henry L. Pierce Seminar, Massachusetts Institute of Technology, Cambridge MA
- 2019** USC Otolaryngology and Hearing & Communication Neuroscience Seminar, Los Angeles CA
- 2019** Grand Rounds, Otolaryngology, Head and Neck Surgery, Columbia Univ.
- 2020** Johns Hopkins University Seminar on Hearing and Balance (virtual)
- 2021** University College London, Ear Institute Seminar (virtual)
- 2021** Association for Research in Otolaryngology Symposium celebrating Bill Brownell (virtual)
- 2021** Mechanics of Hearing pre-meeting webinar (virtual)
- 2021** Colombian Ear Summit (virtual)
- 2021** Thorlabs webinar (virtual, on-line)
- 2023** Eaton Peabody Lab, Massachusetts Eye and Ear Infirmary, Boston MA

Patents:

LANG, J.H., YEISER, A.J., NAKAJIMA, H.H., KYMISSIS, I., OLSON, E., MCHUGH, C.I., AND GRAF, L. 2023. A Fully Differential Piezoelectric Microphone and Amplifier System for Cochlear Implants and Other Hearing Devices. Google patent: US20230247376A1.

Publications:

A. Books and Book Chapters

1. Shera CS and Olson ES (Editors) **2011** What Fire is in Mine Ears: Progress in Auditory Biomechanics Proceedings of the 11th International Mechanics of Hearing Workshop. Published by American Institute of Physics Conference Proceedings, Melville, NY USA

2. Olson ES **2020** "Mechanics of the Cochlea" in Volume II, Audition, of the series "The Senses: A Comprehensive Reference, 2nd Edition". Publisher: Elsevier, Amsterdam.

B. Original, Peer Reviewed Articles

1. Olson, E.S. and Smullin, L.D. **1989** "Frequency tuning in the electroreceptive periphery." *Biophysical J.* **5**: 1191 - 1204.
2. Olson, E.S. and Mountain, D.C. **1991** "In vivo measurement of basilar membrane stiffness." *J.Acoust.Soc.Am.* **89**(3) 1262 - 1275.
3. Olson, E.S. and Mountain, D.C. **1994** "Mapping the cochlear partition's stiffness to its cellular architecture." *J.Acoust.Soc.Am.* **95**: 395 - 400.
4. Nakajima, H.H., Olson, E.S., Mountain, D.C. and Hubbard, A.E. **1994** "Electrically evoked otoacoustic emissions from the apical turns of the gerbil cochlea." *J.Acoust.Soc.Am.* **96**: 786 - 794.
5. Lopez, C.A., Olson, E.S., Adams, J.C., Mou, K., Denhardt, D.T. and Davis, R.L. **1995** "Osteopontin epitopes detected in adult cochleae and inner ear fluids." *Hearing Research* **85**: 210 - 222.
6. Nakajima, H.H., Olson, E.S., Mountain, D.C., and Hubbard, A.E. **1996** "Acoustic overstimulation enhances low-frequency electrically-evoked otoacoustic emissions and reduces high-freq. emissions." *Auditory Neuroscience* **3**: 79-99.
7. Olson, E.S. **1998** "Observing middle and inner ear mechanics with novel intracochlear pressure sensors." *J.Acoust.Soc.Am.* **103**: 3445 – 3463.
8. Olson, E.S. **1999** "Direct measurement of intracochlear pressure waves." *Nature* **402**: 526-529.
9. Olson, E.S. **2001** "Intracochlear pressure measurements related to cochlear frequency tuning." *J.Acoust.Soc.Am.* **110**: 349 – 367.
10. Olson, E.S. **2004** "Harmonic distortion in intracochlear pressure and its analysis to explore the cochlear amplifier." *J.Acoust.Soc.Am.* **115**: 1230 – 1241.
11. Dong, W. and Olson, E.S. **2005** "Two – tone distortion in intracochlear pressure." *J.Acoust.Soc.Am.* **117**: 2999-3015.
12. de La Rochefoucauld, O., Khanna, S.M. and Olson, E.S. **2005** "Recording depth and signal competition in heterodyne interferometry." *J.Acoust.Soc.Am.* **117**: 1267 – 1284.
13. Dong, W. and Olson, E.S. **2006** "Middle Ear Forward and Reverse Transmission in Gerbil." *J.Neurophysiol* **95**: 2951-2961.
14. Olson, E.S. and Dong, W. **2006** "Nonlinearity in intracochlear pressure." *J. Oto-Rhino Laryngology* **68**: 359 – 364.
15. Decraemer, W.F., de La Rochefoucauld, O., Dong, W., Khanna, S.M., Dirckx, J.J.J. and Olson, E.S. **2007** "Scala vestibuli pressure and 3-D stapes velocity measured in direct succession in gerbil." *J.Acoust.Soc.Am.* **121**: 2774-2791.
16. de La Rochefoucauld, O. and Olson, E.S. **2007** "The role of organ of Corti mass in cochlear tuning." *Biophysical J.* **93**: 3434-3450.
17. Ravicz, M.E., Olson, E.S. and Rosowski, J.J. **2007** "Sound pressure distribution and energy flow within the gerbil ear canal from 100 Hz to 80 kHz." *J.Acoust.Soc.Am.* **122**: 2154-2173.
18. Dong, W. and Olson, E.S., **2008** "Supporting evidence for reverse cochlear traveling waves." *J.Acoust.Soc.Am.* **123**: 222-240.
19. de La Rochefoucauld, O., Decraemer, W.F., Khanna, S.M. and Olson, E.S. **2008** "Simultaneous measurements of ossicular velocity and intracochlear pressure leading to the cochlear input impedance in gerbil." *J. Assoc. Res. Otolaryn.* **9**: 161 – 177.
20. Nakajima, H.H., Dong, W., Olson, E.S., Merchant, S.N., Ravicz, M.E. and Rosowski, J.J. **2008** "Differential intracochlear sound pressure measurements in normal human temporal bones." *J. Assoc. Res. Otolaryn.* **10**: 23 – 36.
21. Dong, W. and Olson, E.S. **2009** "In-vivo impedance of the gerbil organ of Corti at auditory frequencies." *Biophysical Journal* **97**: 1233 – 1243.
22. Nakajima, H.H., Dong, W., Olson, E.S., Merchant, S.N., Ravicz, M.E. and Rosowski, J.J. **2010** "Evaluation of round window stimulation using the floating mass transducer by intracochlear sound pressure measurements in human temporal bones" *Otology and Neurotology* **31**:506-511.

23. de La Rochefoucauld O and Olson, E.S. **2010** "A sum of simple and complex motions on the eardrum and manubrium in gerbil." *Hearing Research* 263: 9 – 15.
24. Dong, W. and Olson, E.S. **2010** "Local cochlear damage reduces local nonlinearities and decreases generator-type cochlear emissions while increasing reflector type emissions." *J.Acoust.Soc.Am.* 127: 1422-1431.
25. de La Rochefoucauld O, Kachroo, P. and Olson, E.S. **2010** "Ossicular motion related to middle ear transmission delay in gerbil." *Hearing Research* 270: 158 – 172.
26. Eze, N. and Olson, E.S. **2011** "Basilar membrane velocity in a cochlea with modified organ of Corti." *Biophysical J.* 100: 858-867.
27. Huang S and Olson ES **2011** "Auditory nerve excitation via a non-traveling-wave mode of basilar membrane motion." *J. Assoc. Res. Otolaryn.* **12**: 559 – 575.
28. Shera CS, Olson ES and Guinan JJ **2011** "On cochlear impedances and the miscomputation of power gain." *J. Assoc. Res. Otolaryn.* **12**: 671– 676.
29. Dong W, Decraemer, WF and Olson ES **2012** "Reverse transmission along the ossicular chain in gerbil." *J. Assoc. Res. Otolaryn.* **13**: 447– 459.
30. Huang S, Dong W and Olson ES **2012** "Subharmonic distortion in ear canal pressure and intracochlear pressure and motion." *J. Assoc. Res. Otolaryn* **13**: 461– 471.
31. Olson ES, Duifhuis D and Steele CR **2012** "von Bekesy and cochlear mechanics" *Hearing Research* 293: 31-43.
32. Dong W, Varavva P and Olson ES **2013** "Sound transmission along the ossicular chain in common wild-type laboratory mice" *Hearing Research* 301: 27-34.
33. Dong W and Olson ES **2013** "Detection of cochlear amplification and its activation" *Biophysical Journal* 105: 1067-1078.
34. Bergevin C and Olson ES **2014** "External and middle ear sound pressure distribution and acoustic coupling to the tympanic membrane" *J.Acoust.Soc.Am.* 135: 1294-1312.
35. Decraemer WF, deLaRochefoucauld O, Funnell WRJ and Olson ES **2014** "Three-dimensional vibration of the malleus and incus in the living gerbil" *J. Assoc. Res. Otolaryn.* 15:483-510.
36. Kale S, Cervantes VM, Wu MR, Pisano DV, Sheth N and Olson ES **2014** "A novel perfusion-based method for cochlear implant electrode insertion" *Hearing Research* 314:33-41.
37. Kelso CM, Watanabe H, Wazen JM, Bucher T, Qian ZJ, Olson ES, Kysar JW and Lalwani AK **2014** "Microperforations significantly enhance diffusion across the round window membrane" *Otology and Neurotology* 36: 694-700.
38. Gonzalez-Herrera A and Olson ES **2015** "A study of sound transmission in an abstract middle ear using physical and finite element models" *J.Acoust.Soc.Am.* **138**: 2972-2985.
39. Kale S and Olson ES **2015** "Intracochlear scala media pressure: Measurement, analysis and implications for models of cochlear mechanics" *Biophysical Journal* 109: 2678-2688.
40. Wang Y and Olson ES **2016** "Cochlear perfusion with a viscous fluid," *Hearing Research* 337:1-11.
41. Creighton FP, Guan X, Park S, Kymissis IJ, Nakajima HH, Olson ES **2016** "An Intracochlear Pressure Sensor as a Microphone for a Fully Implantable Cochlear Implant." *Otol Neurotol* 37: 1596-1600.
42. Dong W and Olson ES **2016** "Two-tone suppression of simultaneous electrical and mechanical responses in the cochlea" *Biophysical Journal* 111: 1805-1815.
43. Lin NC, Hendon CP and Olson ES **2017** "Signal competition in optical coherence tomography and its relevance for cochlear vibrometry" *J.Acoust.Soc.Am.* 141: 395-405.
44. Milazzo M, Fallah E, Carapezza M, Kumar NS, Lei JH and Olson ES **2017** "The path of a click stimulus from ear canal to umbo" *Hearing Research* **346**: 1-13.
45. Park S, Guan X, Kim Y, Creighton FX, Wei E, Kymissis I, Nakajima HH, Olson ES **2018** "PVDF-based Piezoelectric Microphone for Sound Detection inside Cochlea: Towards Totally Implantable Cochlear Implants." *Trends in Hearing* **22**:1-11.
46. Lin NC, Fallah E, Strimbu CE, Hendon CP and Olson ES **2019** "Scanning optical coherence tomography probe for in vivo imaging and displacement measurements in the cochlea." *Biomedical Optics Express* **10**:1032-1043.
47. Olson ES and Nowotny M **2019** "Experimental and Theoretical Explorations of Traveling Waves and Tuning in the Bushcricket Ear." *Biophysical J.* **116**: 165-177.

48. Fallah E, Strimbu CE and Olson ES **2019** "Nonlinearity and Amplification in Cochlear Responses to Single and Multi-Tone Stimuli." *Hearing Research* **377**:271-281.
49. Wang Y, Fallah E and Olson ES **2019** "Adaptation of cochlear amplification to low endocochlear potential." *Biophysical J.* **116**: 1769-1786.
50. Nankali A, Wang Y, Olson ES and Grosh K **2020** "A role for tectorial membrane mechanics in activating the cochlear amplifier." *Scientific Reports* 10: 17620.
51. Strimbu CE, Wang Y and Olson ES **2020** "Manipulation of the endocochlear potential reveals two distinct types of cochlear nonlinearity." *Biophysical J.* **119**: 2087-2101.
52. Olson ES and Strimbu CE **2020** "Cochlear mechanics: new insights from vibrometry and Optical Coherence Tomography." *Current Opinion in Physiology* 18: 56-62.
53. Szeto B, Aksit A, Valentini C, Yu M, Werth EG, Goeta S, Tang C, Brown LM, Olson ES, Kysar JW, Lalwani AK **2021** "Novel 3D-Printed Hollow Microneedles Facilitate Safe, Reliable, and Informative Sampling of Perilymph." *Hearing Research* 400:108141,1-10.
54. Fallah E, Strimbu CE and Olson ES **2021** "Nonlinearity of intracochlear motion and local cochlear microphonic: comparison between guinea pig and gerbil." *Hearing Research* 405:108234, 1-13.
55. Gallagher L, Diop M and Olson ES **2021** "Time-domain and frequency-domain effects of tensor tympani contraction on middle ear sound transmission in gerbil." *Hearing Research* 405: 1-15.
56. Szeto B, Valentini C, Aksit A, Werth EG, Goeta S, Brown LM, Olson ES, Kysar JW and Lalwani AK **2021** "Impact of Systemic versus Intratympanic Dexamethasone Administration on the Perilymph Proteome." *Journal of Proteome Research.* 20,8,4001-4009.
57. Frost B and Olson ES **2021** "Model of cochlear microphonic explores the tuning and magnitude of hair cell transduction current." *Biophysical J.* 120: 3550-3565.
58. Strimbu CE and Olson ES **2022** "Salicylate-induced changes in organ of Corti vibrations." *Hearing Research*, 423: 108389, 1-12.
59. Frost B, Strimbu CE and Olson ES **2022** "Using volumetric optical coherence tomography to achieve spatially resolved organ of Corti vibration measurements." *J.Acoust.Soc.Am.* 151: 1115-1124.
60. Cary BG, Zhang JZ, McHugh CI, Kymissis I, Olson ES, Nakajima HH, and Lang JH **2022** "An Umbo Microphone For Fully-Implantable Assistive Hearing Devices." *IEEE SENSORS 22*: 22161-22168.
61. Ashmore J, Oghalai JS, Dewey JB, Olson ES, Strimbu CE, Wang Y, Shera CA, Altoe A, Elgoyhen AB, Eatock RA and Raphael RM **2023** "The remarkable outer hair cell: Proceedings of a symposium in honour of W.E.Brownell" *JARO* 24, 147–15762. de Sousa Lobo Querido R, Ji X, Lakha R, Goodyear RJ, Richardson GP, Vizcarra CL and Olson ES **2023** "Visualizing collagen fibrils in the cochlea's tectorial and basilar membranes using a fluorescently labelled collagen-binding protein fragment" *JARO* 24: 117-127.
63. Frost B, Strimbu CE and Olson ES **2023** "Reconstruction of transverse-longitudinal vibrations in the organ of Corti complex via optical coherence tomography." *J.Acoust.Soc.Am.* 153: 1347.
64. Feng SJ, Leong S, Aksit A, Hébert D, Olson ES, Kysar JW, Lalwani AK **2023** "Physiologic Effects of Microneedle-Mediated Intracochlear Dexamethasone Injection in the Guinea Pig." *The Laryngoscope.*
65. Waring NA, Chern A, Vilarello BJ, Lang JH, Olson ES and Nakajima, HH **2023**. "Sheep as a Large-Animal Model for Otology Research: Temporal Bone Extraction and Transmastoid Facial Recess Surgical Approach." *JARO* (on line first).
66. Zhang JZ, Graf L, Banerjee A, Yeiser A, McHugh CI, Kymissis I, Lang JH, Olson ES and Nakajima HH **2023** "An Implantable Piezofilm Middle Ear Microphone: Performance in Human Cadaveric Temporal Bones" *JARO* (on line first).

C. Monograph chapters / Meetings Proceedings:

1. Hubbard, A.E., Nakajima, H.H., Olson, E.S. and Mountain, D.C. **1990** "Sound induced changes in electrically evoked cochlear emissions." In: Mechanics and Biophysics of Hearing, pp. 186 - 193. Eds. P. Dallos, C.D. Geisler, J.W. Matthews, M. Ruggero, C.R. Steele. Springer-Verlag.
2. Olson, E.S. and Mountain, D.C. **1990** "In vivo measurement of basilar membrane stiffness." In: Mechanics and Biophysics of Hearing, pp. 296 - 303. Eds. P. Dallos, C.D. Geisler, J.W. Matthews, M. Ruggero, C.R. Steele. Springer-Verlag.
3. Olson, E.S. and Mountain, D.C. **1993** "Probing the cochlear partition's micromechanical properties with measurements of radial and longitudinal stiffness variations." In: Biophysics of Hair Cell Sensory Systems, pp. 280 - 287. Eds. H. Duifhuis, J.W. Horst, P. van Dijk and S.M. van Netten. World Scientific Publ.Co.
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21. Gonzalez-Herrera A, Wattamwar K, Bergevin C and Olson ES **2013** "Sound transmission in a simple model of the ear canal and tympanic membrane" Acoustical Society of America, Proceedings of Meetings on Acoustics, Vol 19, No 1.
22. Kale S and Olson ES **2014** "Intracochlear pressure measurements in scala media inform models of cochlear mechanics", Proceedings of the Mechanics of Hearing Meeting, Cape Sounio Greece, 23 – 28 June, 2014.
23. Olson ES and Nakajima HH **2015** "A family of fiber-optic based pressure sensors for intracochlear measurements", Proc. SPIE 9303, February, 2015.
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25. Lin NC, Strimbu CE, Hendon CP, Olson ES **2017** "Adapting a commercial Spectral Domain Optical Coherence Tomography system for time-locked displacement and electrophysiological measurements" Proceedings of the Mechanics of Hearing Meeting, Ontario Canada, June, 2017.
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27. Nankali A, Wang Y, Olson ES and Grosh K **2017**, "Frequency structure in intracochlear voltage supports the concept of tectorial membrane mechanical resonance" Proceedings of the Mechanics of Hearing Meeting, Ontario Canada, June, 2017.
28. Cary BG, Zhang JZ, McHugh CI, Kymissis I, Olson ES, Nakajima HH and Lang JH **2021** "An implantable umbo microphone for fully-implantable assistive hearing devices" Proceedings: IEEE Sensors, October 31 - November 4, 2021.
29. Zhang JZ, Cary BG, Yeiser A, McHugh CI, Kymissis I, Olson ES, Nakajima HH and Lang JH **2022** "A PVDF-TRFE intracochlear hydrophone and amplifier for totally implantable cochlear implants" Proceedings: IEEE Conference on Microelectromechanical Systems, Tokyo, Japan, January 9-13, 2022.
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15. de La Rochefoucauld, O., Khanna, S.M. and Olson, E.S. **2004** "Effect of multiple membranes on the heterodyne laser interferometer." Abstracts of the the 27th midwinter research meeting, Association for Research in Otolaryngology.
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28. Nakajima, H.H., Dong, W., Olson, E.S., Merchant, S.N., Ravicz, M.E. and Rosowski, J.J. **2008** "Trans-cochlear sound pressure measurements in normal human temporal bones." Abstracts of the 31st midwinter research meeting, Association for Research in Otolaryngology.
29. Eze, N. and Olson, E.S. **2008** "Stiffness and longitudinal coupling in the cochlea." Abstracts of the 31st midwinter research meeting, Association for Research in Otolaryngology.
30. Dong, W. and Olson, E.S. **2008** "In vivo impedance of gerbil organ of Corti from 4 -20 kHz." Abstracts of the 31st midwinter research meeting, Association for Research in Otolaryngology.
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32. Dong, W. and Olson, E.S. **2009** "Testing DPOAE generation two-tone component theory in the gerbil cochlea" Abstracts of the 32nd midwinter research meeting, Association for Research in Otolaryngology.
33. Huang, S. and Olson, E.S. **2009** "High frequency plateau in gerbil auditory nerve tuning curves." Abstracts of the 32nd midwinter research meeting, Association for Research in Otolaryngology.
34. Huang, S. and Olson, E.S. **2009** "Probing the Supra-CF Plateau in the Auditory Nerve Tuning Curves in the Gerbil." EAR Meeting, Rutgers University.
35. de La Rochefoucauld and Olson, E.S. **2009** "A sum of simple and complex motions on the eardrum and manubrium in gerbil." Middle ear mechanics in research and otosurgery meeting, Stanford CA, June, 2009.
36. Huang, S., Dong, W. and Olson, E.S. **2010** "Subharmonics and auditory nerve tuning curves in gerbil." Abstracts of the 33rd midwinter research meeting, Association for Research in Otolaryngology.
37. Dong, W., Decraemer, W., deLaRocheffoucauld, O. and Olson, E.S. **2010** "Middle ear reverse transmission in gerbil." Abstracts of the 33rd midwinter research meeting, Association for Research in Otolaryngology.
38. Dong, W., Varavva, P. and Olson, E.S. **2011** "Observing cochlear mechanics in the basal region of CBA mice" Abstracts of the 34th midwinter research meeting, Association for Research in Otolaryngology.
39. Cervantes, V., Pisano, D. and Olson, E.S. **2011** "Development of Hydrodynamic Injection method for Cochlear Implantation in Gerbil" Abstracts of the 34th midwinter research meeting, Association for Research in Otolaryngology.
40. Bergevin C and Olson ES **2012** "Acoustics of the ear canal and middle ear cavity probed with high spatial resolution" Abstracts of the 35th midwinter research meeting, Association for Research in Otolaryngology.
41. Decraemer W, deLaRocheffoucauld O and Olson ES **2012** "Three dimensional motion of the malleus and incus in the living and cadaver gerbil ear" Abstracts of the 35th midwinter research meeting, Association for Research in Otolaryngology.
42. Dong W and Olson ES **2012** "Characterizing the cochlea's electromechanical operation via simultaneous intracochlear pressure and extracellular voltage measurements" Abstracts of the 35th midwinter research meeting, Association for Research in Otolaryngology.
43. Dong W and Olson ES **2013** "Experimental evidence for cochlear amplification and its basis in OHC somatic forces" Abstracts of the 36th midwinter research meeting, Association for Research in Otolaryngology.

44. Dong W and Olson ES **2013** "Transmission of distortion products in the mammalian cochlea" Abstracts of the 36th midwinter research meeting, Association for Research in Otolaryngology.
45. Kale S, Wu M and Olson ES **2013** "Hyaluronic acid perfusion enhances cochlear implant insertion while preserving some degree of hearing function" Abstracts of the 36th midwinter research meeting, Association for Research in Otolaryngology.
46. Olson ES **2013** "Fast waves, slow waves and cochlear excitation" International Congress on Acoustics, Montreal Canada, June 2013.
47. Gonzalez-Herrera A, Wattamwar K, Bergevin C and Olson ES **2013** "Sound transmission in a simple model of the ear canal and tympanic membrane" International Congress on Acoustics, Montreal Canada, June 2013.
48. Zhang A, Olson ES and Kymissis **2013** "An Organic MEMS Fabricated Basilar Membrane Sensor" Conference on implantable auditory prostheses, Lake Tahoe, CA, July 2013
49. Kale, S and Olson ES **2013** "A novel, automated cochlear-implant insertion technique" Conference on implantable auditory prostheses, Lake Tahoe, CA, July 2013
50. Zhang A, Kale S, Olson ES and Kymissis I **2014** "Progress report on a piezoelectric-polymer intra-cochlear pressure sensor and a novel fluid-assisted cochlear implant insertion method" Abstracts of the 37th midwinter research meeting, Association for Research in Otolaryngology.
51. Dong W and Olson ES **2014** "Probing Cochlear Amplification with Measurements of Voltage and Pressure at the Basilar Membrane + Low-frequency Suppression" Abstracts of the 37th midwinter research meeting, Association for Research in Otolaryngology.
52. Olson, ES, Kumar N, Lei J and Bergevin C **2015** "The role of resonance in middle ear transmission" Abstracts of the 38th midwinter research meeting, Association for Research in Otolaryngology.
53. Kale S and Olson ES **2015** "Intracochlear pressure measurements from scala media" Abstracts of the 38th midwinter research meeting, Association for Research in Otolaryngology.
54. Lin NC, Hendon CP and Olson ES **2015** "Phase corruption in Heterodyne Interferometer and Spectral Domain Optical Coherence Tomography signals" International Symposium on Biomedical Imaging, April 2015.
55. Wang Y and Olson ES **2016** "Cochlear Perfusion with a Viscous Fluid" Abstracts of the 39th midwinter research meeting, Association for Research in Otolaryngology.
56. Kale S and Olson ES **2016** "Coupled scala media and tympani pressure measurements constrain dual-partition models" Abstracts of the 39th midwinter research meeting, Association for Research in Otolaryngology.
57. Lin NC, Hendon CP and Olson ES **2016** "Using a commercially available Optical Coherence Tomography system to measure vibrations within the cochlea" Abstracts of the 39th midwinter research meeting, Association for Research in Otolaryngology.
58. Creighton F, Guan X, Park S, Kymissis I, Nakajima HH and Olson ES **2016** "Validation of an intracochlear piezoelectric microphone" Abstracts of the 39th midwinter research meeting, Association for Research in Otolaryngology.
59. Park S, Olson ES, Kymissis I, Bao Z **2016** "Static and dynamic pressure sensing using stretchable carbon nanotube-based and piezoelectric polymer-based capacitive sensors and their application in tactile and sound pressure detection" International Conference on Electronic Materials and Nanotechnology for Green Environment" Nov 6-9 2016, Jeju South Korea.
60. Olson ES **2016** "Intracochlear Pressure and Voltage Measurements Support Dual-Mode Cochlear Models" 2016 SIAM Conference on the Life Sciences, Boston MA.
61. Creighton F, Guan X, Park S, Kymissis I, Nakajima HH and Olson ES **2016** "Investigation of piezoelectric sensors for implantable otologic microphones" COSM – Combined Otolaryngology Spring Meetings, May 18-20 2016, Chicago, IL.
62. Nowotny M, Carapezza M, Kale S and Olson ES **2017** "Fluid pressure at the sensory tissue of a tonotopical insect ear" Abstracts of the 40th midwinter research meeting, Association for Research in Otolaryngology.
63. Milazzo M, Fallah E, Carapezza M and Olson ES **2017** "The path of a click from ear canal to umbo" Abstracts of the 40th midwinter research meeting, Association for Research in Otolaryngology.
64. Olson, ES **2017** "From passive to active mechanics in the cochlea" 2017 SIAM Conference, Snowbird, UT.

65. Lin NC, Strimbu CE, Fallah E, Hendon CP and Olson ES **2018** "Customizing a commercial Spectral Domain Optical Coherence Tomography system for standard free-space and fiber optic probe intracochlear measurements." SPIE conferece, SanFrancisco CA, January 2018.
66. Park KH, Paik H, Zhao J, Dong W, Olson ES, Liem RKH, Kim AH **2018** "Cochlear nerve hypotrophy and degeneration in a mouse model of Charcot-Marie-Tooth type 2E disease," Abstracts of the 41st midwinter research meeting, Association for Research in Otolaryngology.
67. Fallah F, Strimbu CE, Olson ES **2018** "Outer Hair Cell and Basilar Membrane Responses to Zwuis Tone Complexes" Abstracts of the 41st midwinter research meeting, Association for Research in Otolaryngology.
68. Wang Y, Fallah E, Olson ES **2018** "Variations in OHC-generated Voltage and DPOAEs with low EP," Abstracts of the 41st midwinter research meeting, Association for Research in Otolaryngology.
69. Strimbu CE, Lin NC and Olson ES **2018** "Using optical coherence tomography to measure active cochlear mechanics in the gerbil," 175th Meeting of the Acoustical Society of America, May 2018, Minneapolis, MN.
70. Olson ES, Park S, Guan X, Creighton F, Kymissis I, Nakajima HH **2018** "Development of implantable microphones for a totally implantable cochlear implant" 8th International Symposium on Middle Ear Mechanics in Research and Otology, July 5-9, 2018, Shanghai, China
71. Strimbu CE, Olson ES **2018** "Using Optical Coherence Tomography to Measure Differential Motion Within the Cochlea" Eastern Auditory Retreat June 15, 2018, New York City.
72. Strimbu CE, Olson ES **2019** "Optical Coherence Tomography and Spectral Domain Phase Microscopy Reveal Complex Differential Motion within the Cochlea" Abstracts of the 42nd midwinter research meeting, Association for Research in Otolaryngology.
73. Diop M, Olson ES **2019** "Effect of Tensor Tympani on High Fidelity Sound Transmission Through the Middle Ear" Abstracts of the 42nd midwinter research meeting, Association for Research in Otolaryngology.
74. Lin NC, Fallah E, Strimbu CE, Olson ES **2019** "Scanning fiber optic SDOCT-based probe for intracochlear imaging and displacement measurement" Abstracts of the 42nd midwinter research meeting, Association for Research in Otolaryngology.
75. Wang Y, Fallah E and Olson ES **2019** "Following furosemide, a shift in the OHC transducer operating point causes cochlear amplification to recover more slowly than EP" Abstracts of the 42nd midwinter research meeting, Association for Research in Otolaryngology.
76. Olson ES, Strimbu CE, Lin NC and Fallah E **2019** "Drilling Further in the Cochlear Base with Displacement and Extracellular Voltage Measurements" Abstracts of the 42nd midwinter research meeting, Association for Research in Otolaryngology.
77. Strimbu CE, Wang Y, Olson ES **2020** "Effects of Furosemide on Organ of Corti Vibrations" Abstracts of the 43rd midwinter research meeting, Association for Research in Otolaryngology.
78. Fallah E, Strimbu CE, Olson ES **2020** "Cochlear Nonlinearity and Amplification in the Guinea Pig" Abstracts of the 43rd midwinter research meeting, Association for Research in Otolaryngology.
79. Szeto B, Valentini C, Aksit A, Yu M, Werth EG, Brown LM, Olson ES, Kysar JW, Lalwani AK **2020** "Novel 3D-Printed Hollow Microneedles Can Facilitate Safe and Reliable Aspiration of Perilymph for Proteomic Analysis" Abstracts of the 43rd midwinter research meeting, Association for Research in Otolaryngology.
80. Cary BG, Zhang JZ, Verhaert N, Losenegger T, Nakajima HH, Olson ES, Lang JH **2020** "Optimizing Microphones for Fully Implantable Assistive Hearing Devices" Abstracts of the 43rd midwinter research meeting, Association for Research in Otolaryngology.
81. Zhang JZ, Cary BG, Olson ES, Lang JH and Nakajima HH **2021** "A PVDF intracochlear hydrophone for fully implantable assistive devices" Abstracts of the 44th midwinter research meeting, Association for Research in Otolaryngology.
82. Szeto B, Valentini C, Aksit A, Goeta S, Brown LM, Olson ES, Kysar JW, Lalwani AK **2021** "VGF nerve growth factor inducible is upregulated in guinea pig perilymph after dexamethasone administration" Abstracts of the 44th midwinter research meeting, Association for Research in Otolaryngology.

83. Cary BG, Zhang JZ, Olson ES, Nakajima HH, Lang JH **2021** "Optimizing an Umbo Microphone for Fully Implantable Assistive Hearing Devices via Analytical and Numerical Modeling" Abstracts of the 44th midwinter research meeting, Association for Research in Otolaryngology.
84. Frost B and Olson ES **2021** "Cochlear Microphonic Measurements Indicate Sharper Tuning at Stereocilia Than at Basilar Membrane" Abstracts of the 44th midwinter research meeting, Association for Research in Otolaryngology.
85. Strimbu CE and Olson ES **2021** "The Effects of Salicylate on Sound-Evoked Vibrations on the Basilar Membrane and Outer Hair Cell Region in Vivo" Abstracts of the 44th midwinter research meeting, Association for Research in Otolaryngology.
86. Gallagher L and Olson ES **2021** "Tensor tympani contraction produces frequency-dependent changes in middle ear sound transmission in gerbil" Abstracts of the 44th midwinter research meeting, Association for Research in Otolaryngology.
87. Fallah E, Strimbu CE and Olson ES **2021** "New Findings in Mechanics of the Cochlea in Guinea Pig Versus Gerbil" Abstracts of the 44th midwinter research meeting, Association for Research in Otolaryngology.
88. Yeiser AJ, Bannerjee A, Zhang J, Graf L, McHugh CI, Song Y, Kymissis I, Olson ES, Nakajima HH, Lang JH **2022** "Implantable Piezoelectric-Polymer Microphones for the Middle Ear." Middle ear mechanics in research and otosurgery meeting, Boulder CO, June, 2009.

89. Leong S, Aksit A, Szeto B, Ji X, Soni R, Olson ES, Kysar J, Lalwani A **2022** "Anatomic, Physiologic, and Proteomic Consequences of Repeated Microneedle-Mediated Perforations of the Round Window Membrane" Abstracts of the 45th midwinter meeting of the Association for Research in Otolaryngology.
90. Frost B, Strimbu CE, Olson ES **2022** "Using Volumetric Optical Coherence Tomography to Achieve Spatially Resolved Organ of Corti Vibration Measurements" Abstracts of the 45th midwinter meeting of the Association for Research in Otolaryngology.
91. Zhang JZ, Yeiser AJ, McHugh C, Kymissis I, Olson ES, Nakajima HH, Lang JH **2022** "Modeling and Characterization of a PVDF-TrFE Intracochlear Hydrophone for Totally Implantable Cochlear Implants" Abstracts of the 45th midwinter meeting of the Association for Research in Otolaryngology.
92. Strimbu CE, Fallah E, Olson ES **2022** "Deeper Investigation Into the Effect of Furosemide on Cochlear Vibratory Responses and Stereocilia Morphology" Abstracts of the 45th midwinter meeting of the Association for Research in Otolaryngology.
93. Ferreira Querido RL, Ji X, Makovsky A, Richardson GP, Olson ES, Vizcarra CL **2022** "Visualizing Collagen Fibers in the Basilar and Tectorial Membranes Using CNA35-OG, a Fluorescently Labelled Bacterial-Adhesion Protein" Abstracts of the 45th midwinter meeting of the Association for Research in Otolaryngology.
94. McHugh CI, Cary BG, Cheng YS, Hem C, Zhang JZ, Olson ES, Lang JH, Nakajima HH **2022** "Testing of an Implantable Umbo Microphone in Temporal Bone" Abstracts of the 45th midwinter meeting of the Association for Research in Otolaryngology.
95. Yeiser AJ, Zhang JZ, Cary BG, McHugh CI, Olson ES, Kymissis I, Nakajima HH, Lang JH **2022** "A Sensitive and EMI-Resistant Fully Implantable Microphone" Abstracts of the 45th midwinter meeting of the Association for Research in Otolaryngology.
96. Ziaei M, Kuhlmeier M, Kim AH, Lang JH, Nakajima HH, Kymissis I, Olson ES **2022** "Update on the development and testing of a microphone for a totally implanted cochlear implant" Northeast Bioengineering Conference New York City, NY April 23-24 2022.
97. Waring, NA, Vilarello, BJ, Nakajima HH, Olson ES and Chern A **2023** "Sheep as a large-animal model for otology research: temporal bone extraction and middle ear access" Abstracts of the 46th midwinter meeting of the Association for Research in Otolaryngology.
98. Chiriboga L, Frost BL, Strimbu CE and Olson ES **2023** "Development of a coupled common-mode OCT probe with a voltage electrode for simultaneous intracochlear motion and voltage measurements in guinea pig" Abstracts of the 46th midwinter meeting of the Association for Research in Otolaryngology.

99. Zhang JZ, Yeiser A, McHugh CI, Graf L, Wawrzynek E, Lang JH, Olson ES, Kymissis I and Nakajima HH **2023** "Progress and challenges with implantable microphones for cochlear implants" Abstracts of the 46th midwinter meeting of the Association for Research in Otolaryngology.
100. Strimbu CE and Olson ES **2023** "Responses in the hook region of the gerbil cochlea before and after disruption of the endocochlear potential with IV furosemide" Abstracts of the 46th midwinter meeting of the Association for Research in Otolaryngology.
101. Olson ES **2023** "Charles Steele's entrance into cochlear mechanics: JASA papers from the 1970s through 1980" Abstracts of the 46th midwinter meeting of the Association for Research in Otolaryngology.
102. Feng SJ, Leong S, Aksit A, Hébert D, Olson ES, Kysar JW and Lalwani AK **2023** "Physiologic Effects of Direct Intracochlear Injection of Dexamethasone Mediated by Microneedles" Triological Society Combined Sections Meeting.
103. Feng SJ, Zhou C, Leong S, Hébert D, Breil E, Voruz F, Aksit A, Olson ES, Kysar JW and Lalwani AK **2023** " Microneedle-Mediated Injection of Gadodiamide Through the Round Window Membrane to Facilitate Diagnosis of Endolymphatic Hydrops Using MRI" Abstracts of the 46th midwinter meeting of the Association for Research in Otolaryngology.
104. Waring NA, Vilarello BJ, Song Y, Nakajima HH, Olson ES and Chern A **2023** "Sheep as a large-animal model for otology research: temporal bone extraction and middle ear access" Triological Society Combined Sections Meeting.