

MELISSA L. CARAS, Ph.D.

Contact Information

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@CarasLab (Twitter)

Education

2013 Ph.D. Neurobiology and Behavior | University of Washington
2007 B.S. Neuroscience, Biology | Brandeis University

Positions

2019 - present Assistant Professor | Department of Biology
University of Maryland College Park
2013 - 2019 Postdoctoral Fellow | Center for Neural Science
New York University

Fellowships, Honors, and Awards

2021 Early career reviewer, NIH AUD Study Section
2021 Ad hoc reviewer, Royal National Institute for Deaf People
2021 - 2023 NARSAD Young Investigator Award
2017 - 2022 NIH/NIDCD K99/R00 Pathway to Independence Award
2016 Travel Award, Auditory System Gordon Research Conference
2016 Travel Award, Advances and Perspectives in Auditory Neuroscience
2015 - 2020 NIH/NIDCD Pediatric Loan Repayment Program Award
2015 - 2017 NIH/NIDCD F32 NRSA Postdoctoral Fellowship
2010 - 2013 NIH/NIDCD F31 NRSA Predoctoral Fellowship
2010 Travel Award, International Society for Neuroethology Student
2010 Travel Award, Graduate and Professional Student Senate
2010 Travel Award, Association for Research in Otolaryngology
2008 - 2010 NIH/NIDCD T32 NRSA Research Training in Speech and Hearing Sciences
2009 Honorable Mention, NSF Graduate Research Fellowship Program
2007-2009 Achievement Reward for College Scientists (ARCS) Foundation Fellowship

Peer-Reviewed Publications

- Caras, M.L.**, Happel, M.F.K., Chandrasekaran, B., Ripollés, P., Keesom, S.M., Hurley, L.M., Remage-Healey, L., Holt, L.L., Wright, B.A. (2022) Non-sensory influences on auditory learning and plasticity. *Journal of the Association of Research in Otolaryngology*. doi:10.1007/s10162-022-00837-3.
- Wang, L., **Caras, M.L.**, Karayannis T., Froemke, R.C. (2021) Editorial: Mechanisms underlying experience-dependent plasticity of cortical circuits. *Frontiers in Cellular Neuroscience*. 15:687297.
- Mowery, T.M.* , **Caras, M.L.***, Hassan, S., Wang, D., Dimidschstein, J., Fishell, G., Sanes, D.H. (2019) Preserving inhibition during developmental hearing loss rescues auditory learning and perception. *Journal of Neuroscience*. 39(42):8347-8361. (*equal contribution)
- Caras, M.L.** and Sanes, D.H. (2019) Neural variability limits adolescent skill learning. *Journal of Neuroscience*. 39(15):2889-2902.
- Featured article in This Week in the Journal: Esch, T. (2019) More neuronal variability, slower learning in adolescents. *Journal of Neuroscience*. 39(15):2775.

- Caras, M.L.**, Sanes, D.H. (2017) Top-down modulation of sensory cortex gates perceptual learning. *Proceedings of the National Academy of Sciences*. 114(37): 9972-9977.
- Larson, T.A., Lent, K.L., Bammler, T.K., MacDonald, J.W., Wood, W.E., **Caras, M.L.**, Thatra, N.M, Budzillo, A., Perkel, D.J., Brenowitz, E.A. (2015) Network analysis of microRNA and mRNA seasonal dynamics in a highly plastic sensorimotor neural circuit. *BMC Genomics*. 16:905.
- Caras, M.L.**, Sanes, D.H. (2015) Sustained perceptual deficits from transient sensory deprivation. *Journal of Neuroscience*. 35(30):10851-10865.
- Caras, M.L.**, Sen, K., Rubel, E.W., Brenowitz, E. (2015) Seasonal plasticity of precise spike timing in the avian auditory system. *Journal of Neuroscience*. 35(8): 3431-3445.
- Buran, B., Sarro, E, Manno, F., Kang, R., **Caras, M.L.**, Sanes, D.H. (2014) A sensitive period for the impact of hearing loss on auditory perception. *Journal of Neuroscience*. 34(6):2276-84.
- Caras, M.L.** (2013) Estrogenic modulation of auditory processing: a vertebrate comparison. *Frontiers in Neuroendocrinology*. 34(4):285-299.
- Larson, T.A., Wang, T., Gale, S.D., Miller, K.E., Thatra, N.M., **Caras, M.L.**, Perkel, D.J., Brenowitz, E.A. (2013) Post-Synaptic Neural Activity Regulates Neuronal Addition in the Adult Avian Song Control System. *Proceedings of the National Academy of Sciences*. 110(41):16640-16644.
- Caras, M.L.**, O'Brien, M., Brenowitz, E.A. and Rubel, E.W. (2012) Estradiol selectively enhances auditory function in avian forebrain neurons. *Journal of Neuroscience*. 32(49):17597-17611.
- Caras, M.L.**, Brenowitz, E. and Rubel, E.W. (2010) Peripheral auditory processing changes seasonally in Gambel's white-crowned sparrows. *Journal of Comparative Physiology A*. 196(8): 581-599.
- Caras, M.L.**, MacKenzie, K., Rodwin B., and Katz, D.B. (2008) Investigating the motivational mechanism of altered saline consumption following 5-HT_{1A} manipulation. *Behavioral Neuroscience*. 122(2): 407-415.

Book Chapters

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- Caras, M.L.** and Ramage-Healey, L. (2016) Control of peripheral and central auditory processing by estrogen in birds. pp 77-100. In: *Hearing and Hormones. Springer Handbook of Auditory Research*. A. Bass, J. Sisneros, Fay, D. and Popper, A. eds. Springer Science and Business Media, LLC, New York.

Invited Seminars and Lectures

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| 2022 | University of Illinois, Urbana-Champaign, IL. (Virtual platform due to COVID-19.)
Biology of the Inner Ear Course, Marine Biological Laboratory, Woods Hole, MA.
University of Virginia, Charlottesville, VA. |
| 2021 | Ear Institute, University College London, England. (Virtual platform due to COVID-19.)
University of Maryland School of Medicine, Baltimore, MD.
Johns Hopkins University, Baltimore, MD. |
| 2020 | EARS (Electronic Auditory Research Seminars). Crowdcast. https://www.crowdcast.io/e/ears |
| 2018 | C-CEBH/NIDCD Joint Meeting. College Park, MD.
Auditory SPLASH meeting. Philadelphia, PA.
University of Maryland, College Park, MD
Emory University, Atlanta, GA
University of Colorado, Denver, CO
University of Utah, Salt Lake City, UT
Northeast Ohio Medical University, Rootstown, OH.
Stanford University, Palo Alto, CA. |

- 2017 University of Iowa, Iowa City, IA.
University of Pittsburgh, Pittsburgh, PA.
Mass Eye and Ear, Boston, MA.
Cornell University, Ithaca, NY.
Georgia State University, Atlanta, GA.
Lehigh University, Bethlehem, PA.
York College, York, PA.
- 2016 New York University, New York, NY.
- 2015 University of Massachusetts, Amherst, MA.
- 2014 Brooklyn College, New York, NY.
- 2012 University of Washington, Seattle, WA.
- 2011 ARCS Annual Spring Luncheon, Seattle, WA.
- 2010 University of Washington, Seattle, WA.

Podium Presentations

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- Macedo-Lima, M.*, Jones, L., Ying, R., **Caras, M.L.** (2022) Activity of orbitofrontal cortical neurons that project to auditory cortex correlates with perceptual sensitivity. *International Conference on the Auditory Cortex*. Magdeburg, Germany. *Presenting author.
- Macedo-Lima, M.*, Jones, L., Ying, R., **Caras, M.L.** (2022) The role of orbitofrontal cortex in auditory perceptual learning. *Gordon Research Conference: Auditory System*. Smithfield, RI. *Presenting author.
- Macedo-Lima, M.*, Jones, L., Ying, R., **Caras, M.L.** (2022) Orbitofrontal Cortex Activity Modulates Auditory Cortex Responses and Sound Detection and Correlates With Perceptual Sensitivity. *Association for Research in Otolaryngology Midwinter Meeting*. San Jose, CA. *Presenting author.
- Caras, M.L.**, Wright, B. (2021) Contributions of top-down circuits to perceptual learning. *Association for Research in Otolaryngology Midwinter Meeting*. Virtual platform due to COVID-19.
- Caras, M.L.**, Mowery, T.M., Hassan, S., Wang, D., Sanes, D.H. (2018) Increasing inhibitory gain during development enhances perception. *Gordon Research Conference: Auditory System*. Smithfield, RI.
- Caras, M.L.**, Wang, D., Sanes, D.H. (2017) Cortical mechanisms of perceptual learning. *Association for Research in Otolaryngology Midwinter Meeting*. Baltimore, MD.
- Caras, M.L.**, Brenowitz E.A., Rubel, E.W. (2012) Reproductive hormones modulate spike-timing based auditory intensity discrimination. *Northwest Auditory and Vestibular Research Meeting*. Oregon Health and Sciences University, Portland, OR.
- Caras, M.L.**, Brenowitz E.A., Rubel, E.W. (2012) Estradiol selectively enhances auditory function. *Gordon Research Seminar: Auditory System*. Lewiston, ME.
- Caras, M.L.**, Brenowitz E.A., Rubel, E.W. (2011) The effects of breeding condition on auditory processing in a wild songbird. *Gordon Research Seminar: Neuroethology: Behavior, Evolution & Neurobiology*. Easton, MA.
- Caras, M.L.**, Brenowitz E.A., Rubel, E.W. (2010) Hormonal effects on auditory processing in a wild songbird. *Northwest Auditory and Vestibular Research Meeting*. University of Washington, Seattle, WA.

Conference Abstracts

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- Ying, R., **Caras, M.L.** (2022) Subcortical plasticity during perceptual learning. *Gordon Research Conference: Auditory System*. Smithfield, RI.
- Ying, R., **Caras, M.L.** (2021) Determining the role of the auditory midbrain in perceptual learning. *Association for Research in Otolaryngology Midwinter Meeting*. Virtual format due to COVID-19.
- Macedo-Lima, M., Jones, L.S., Ying, R., **Caras, M.L.** (2021) Orbitofrontal cortex activity modulates auditory cortex responses and sound detection and correlates with perceptual sensitivity. *Advances and Perspectives in Auditory Neuroscience*. Virtual format due to COVID-19.

- Ying, R., **Caras, M.L.** (2021) Determining the role of the auditory midbrain in perceptual learning. *Advances and Perspectives in Auditory Neuroscience*. Virtual format due to COVID-19.
- Caras, M.L.**, Sanes, D.H. (2019) Neural variability limits adolescent skill learning. *Association for Research in Otolaryngology Midwinter Meeting*. Baltimore, MD.
- Caras, M.L.**, Mowery, T.M., Hassan, S., Wang, D., Sanes, D.H. (2018) Increasing inhibitory gain during development enhances perception. *Gordon Research Seminar: Auditory System*. Smithfield, RI.
- Caras, M.L.**, Sanes, D.H. (2017) Cortical mechanisms of perceptual learning in juveniles. *Society for Neuroscience Annual Meeting*. Washington, D.C.
- Caras, M.L.**, Sanes, D.H. (2017) Cortical mechanisms of perceptual learning in juveniles. *Advances and Perspectives in Auditory Neuroscience*. Washington, D.C.
- Caras, M.L.**, Sanes, D.H. (2017) Cortical mechanisms of perceptual learning in juveniles. *International Conference on the Auditory Cortex*. Banff, Alberta, Canada.
- Caras, M.L.**, Wang, D., Sanes, D.H. (2016) Cortical mechanisms of perceptual learning. *Society for Neuroscience Annual Meeting*. San Diego, CA.
- Caras, M.L.**, Wang, D., Sanes, D.H. (2016) Cortical mechanisms of perceptual learning. *Advances and Perspectives in Auditory Neuroscience*. San Diego, CA.
- Caras, M.L.**, Sanes, D.H. (2015) Cortical encoding in juvenile animals during a psychometric task. *Association for Research in Otolaryngology Midwinter Meeting*. Baltimore, MD.
- Caras, M.L.**, Sanes, D.H. (2014) Transient hearing loss disrupts subsequent amplitude modulation detection. *Advances and Perspectives in Auditory Neurophysiology*. Washington, DC.
- Caras, M.L.**, Sanes, D.H. (2014) Transient hearing loss disrupts subsequent amplitude modulation detection. *Society for Neuroscience Annual Meeting*. Washington, DC.
- Caras, M.L.**, Sanes, D.H. (2014) Transient hearing loss disrupts subsequent amplitude modulation detection. *Auditory System Gordon Research Seminar and Conference*. Lewiston, ME.
- Woods, V., **Caras, M.L.**, Zheng, Z., Wang, J., Bink, H., Bossi, S., Triumpis, M., Insanally, M., Froemke, R., Sanes, D.H., Viventi, J. (2014) Recording and stimulation of the cortical surface for modulation of evoked auditory potentials. *Neural Interfaces Conference*. Dallas, TX.
- Caras, M.L.**, Sanes, D.H. (2014) A brief period of developmental hearing loss transiently disrupts amplitude modulation detection. *Association for Research in Otolaryngology Midwinter Meeting*. San Diego, CA.
- Caras, M.L.**, Sanes, D.H. (2013) A brief period of developmental hearing loss transiently disrupts auditory perception. *NYU Center for Neural Science Biannual Retreat*. Montauk, NY.
- Caras, M.L.**, O'Brien, M., Brenowitz, E., Rubel, E.W. (2012) Estradiol selectively enhances auditory function in monotonically driven forebrain neurons. *Society for Neuroscience Annual Meeting*. New Orleans, LA.
- Caras, M.L.**, O'Brien, M., Brenowitz, E., Rubel, E.W. (2012) Estradiol selectively enhances auditory function in monotonically driven forebrain neurons. *Gordon Research Conference: Auditory System*. Lewiston, ME.
- Caras, M.L.**, Brenowitz, E., Rubel, E.W. (2011) Hormonal effects on forebrain auditory processing in male and female songbirds. *Society for Neuroscience Annual Meeting*. Washington, D.C.
- Caras, M.L.**, Pollak, J., Fung, S., Mehravari, A., Watari, H. (2011) Sustainability of outreach programs over time: A look back through the first five years. *Society for Neuroscience Annual Meeting*. Washington, D.C.
- Caras, M.L.** (2011) The effects of breeding condition on auditory processing in a wild songbird. *Gordon Research Seminar: Neuroethology: Behavior, Evolution & Neurobiology*. Easton, MA.
- Smarr, B., Corke, A., Lee, M., Georgi, S., Watari, H., **Caras, M.L.**, Chudler, E. (2010) Expanding out reach: Using technology and the internet in neuroscience outreach. *Society for Neuroscience Annual Meeting*. San Diego, CA.

- Caras, M.L.**, Brenowitz, E. and Rubel, E.W. (2010) Peripheral auditory processing changes seasonally in Gambel's white-crowned sparrows. *International Congress for Neuroethology*. Salamanca, Spain.
- Caras, M.L.**, Brenowitz, E. and Rubel, E.W. (2010) Peripheral auditory processing changes seasonally in Gambel's white-crowned sparrows. *Association for Research in Otolaryngology Midwinter Meeting*, Anaheim, CA.
- Georgi, S., Harris, R., Watari, H., White, B., **Caras, M.L.**, Smarr, B., Chudler, E. (2008) Expanding our reach: Ideas and resources for neuroscience outreach. *Society for Neuroscience Annual Meeting*. Washington, D.C.
- Caras, M.L.**, MacKenzie, K., Rodwin B., and Katz, D.B. (2007) Investigating the motivational mechanism of altered saline consumption following 5-HT_{1A} manipulation. *Society for Neuroscience Annual Meeting*. San Diego, CA.

Teaching

2021 - present	BSCI353/NEUR306 Principles of Neuroscience/ Cellular and Molecular Neuroscience Instructor I University of Maryland, College Park, MD
2019 - present	BSCI355 Neurobiology of Extraordinary Senses Instructor I University of Maryland, College Park, MD
2016	Development and Dysfunction of the Nervous System Teaching Assistant I New York University, New York, NY
2011	Undergraduate Neurobiology Journal Club Instructor I University of Washington, Seattle, WA
2008	Introduction to Neurobiology Teaching Assistant I University of Washington, Seattle, WA

Trainees and Mentorship

Postdoctoral Researchers

2022 - present	Jéssica Winne
2020 - present	Matheus Macedo-Lima
2020 - 2021	Lashaka Jones

Graduate Students

2021	Johena Sanyal (BISI rotation student)
2020 - present	Rose Ying

Undergraduate Student Researchers

2021 - 2022	Laudan Nikoobakht	(University of Maryland)
2021 - present	Nicole Miko	(University of Maryland)
2019 - present	Rakshita Balaji	(University of Maryland)
2019 - 2022	Gabriel Dayanim	(University of Maryland)
2017 - 2019	Lily Hitelman	(New York University)
2017 - 2019	Syeda Hassan	(New York University)
2015 - 2017	Teren Yedikian	(New York University)
2015 - 2017	Derek Wang	(New York University)
2014 - 2015	Amar Patel	(New York University)
2013 - 2014	Cindy Tsui	(New York University)

High School Students

2014 -2017	Lucero Torres	iMentor Partnership, New York City
2010 - 2011	Scott Mitchell	NWABR, Seattle, WA

Other

2022 - present	Shreya Gunda	BIOL dept. sponsor for Honors Program
2022 - present	Sarah Ou	BIOL dept. sponsor for Honors Program
2021 - 2022	Debbie Adam	BIOL dept. sponsor for Honors Program
2020 - present	Cathy Sung	spARO Mentorship Program
2015	Charlotte Nahley	High school job shadow, New York City

Professional Service and Memberships

Department, program, college, and university service

2021 - 2022	Member, Biology Department HR Manager Search Committee
2021 - present	Member, NACS Executive Committee
2021	Member, University of Maryland Faculty Animal Planning and Advisory Committee
2020 - present	Founder and Chair, NACS Diversity and Inclusion Committee

Trainee committee membership

2022	Chengjie (Gary)Huang, Postdoc, Anderson and Goupell labs (Role: K99 co-advisor)
2022 - present	Jeffrey Baffoe-Bonnie, NACS student, Burgess Lab NIH (Role: UMD co-advisor)
2022 - present	Jason Putnam, NACS student, Francis Lab
2021	Kevin Schenider, NACS student, Roesch Lab
2021 - present	Vladimir Butyrkin, NACS student, Corbin Lab
2020 - present	Binghan Xue, MOCB student, Kanold Lab
2020 - present	Jiachen Liu, NACS student, Butts Lab
2020 - present	Norma Peña-Flores, NACS student, Herberholz Lab
2020 - present	Andrew Borrell, NACS student, Quinlan Lab
2020	Jeong-Yoon, Undergraduate Student, Kanold Lab
2019 - present	Rachel Thompson, NACS student, Slevc Lab
2019-2021	Ira Kraemer, NACS student, Carr Lab

Conference organization and service

2021	Symposium Chair, Association for Research in Otolaryngology
2021	Panelist, Association for Research in Otolaryngology Job Search Panel
2020 - present	Member, Advances and Perspectives in Auditory Neuroscience Program Committee
2020 - present	Member, Association for Research in Otolaryngology Travel Awards Committee
2018	Chair, Auditory System Gordon Research Seminar
2016	Vice Chair, Auditory System Gordon Research Seminar
2016	Panelist, Auditory System Gordon Research Seminar Career Panel

Editorial service

2020 - present	Review Editor, Frontiers in Neural Circuits
2019 - present	Review Editor, Frontiers in Cellular Neuroscience

Ad Hoc Reviewer (selected list)

Nature Communications
Journal of Neuroscience
Journal of Physiology
Journal of Neurophysiology
PLOS Biology
Scientific Reports

For full list see <https://publons.com/author/1217033/melissa-l-caras#profile>

Professional memberships

2009 - present Member, Association for Research in Otolaryngology
2007 - present Member, Society for Neuroscience

Public Outreach and Advocacy

2015 - 2019 Volunteer, NYU Neuroscience Outreach Group
2014 Media interview. Song Bird Study Could Lead to Improved Prosthetic Limbs (For Humans). National Public Radio. WABE, Atlanta, GA. 11 Dec. 2014.
2012 SfN Host for Neuroscience Olympiad Champion, New Orleans, LA.
2012 Presenter, Expanding Your Horizons Workshop for High School Girls, Bellevue, WA
2011 UW Brain Awareness Week Open House Coordinator, Seattle, WA
2009 American Society for Biochemistry and Molecular Biology Representative, Capitol Hill Lobbying Day. Washington, D.C.
2007- 2013 K-12 Liaison and Webmaster, UW Neurobiology and Behavior Community Outreach