

# MELISSA L. CARAS, Ph.D.

## Contact Information

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## Education

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

## Positions

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

## Fellowships and Awards

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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

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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.
- 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<sub>1A</sub> manipulation. *Behavioral Neuroscience*. 122(2): 407-415.

## Reviews, Book Chapters, and Editorials

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- 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.
- 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.
- Caras, M.L.** (2013) Estrogenic modulation of auditory processing: a vertebrate comparison. *Frontiers in Neuroendocrinology*. 34(4):285-299.

## Invited Seminars

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| 2021 | Ear Institute, University College London, England. (Virtual platform due to COVID-19.)   |
| 2020 | EARS (Electronic Auditory Research Seminars). Crowdcast. <a href="https://www.crowdcast.io/e/ears">https://www.crowdcast.io/e/ears</a>   |
| 2018 | C-CEBH/NIDCD Joint Meeting. College Park, MD.<br>Auditory SPLASH meeting. Philadelphia, PA.<br>University of Maryland, College Park, MD<br>Emory University, Atlanta, GA<br>University of Colorado, Denver, CO<br>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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- 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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- 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., Vivenzi, 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<sub>1A</sub> manipulation. *Society for Neuroscience Annual Meeting*. San Diego, CA.

## Teaching

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2021 Neurobiology of Extraordinary Senses (formerly known as Sensation and Perception)  
Instructor | University of Maryland, College Park, MD.

2019 Sensation and Perception  
Instructor | University of Maryland, College Park, MD

2016 Development and Dysfunction of the Nervous System  
Teaching Assistant | New York University, New York, NY

2011 Undergraduate Neurobiology Journal Club  
Instructor | University of Washington, Seattle, WA

2008 Introduction to Neurobiology  
Teaching Assistant | University of Washington, Seattle, WA

## Trainees and Mentorship

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### Postdoctoral Researchers

2020 - present Matheus Macedo-Lima  
2020 - 2021 Lashaka Jones

### Graduate Students

2020 - present Rose Ying

### Undergraduate Student Researchers

2019 - present	Rakshita Balaji	(University of Maryland)
2019 - present	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

2020 - present        Cathy Sung                spARO Mentorship Program  
2015                    Charlotte Nahley         High school job shadow, New York City

## Professional Service and Memberships

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### University service

2021 - present        Member, University of Maryland Faculty Animal Planning and Advisory Committee  
2020 - present        Founder and Chair, NACS Diversity and Inclusion Committee

### 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

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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