

Curriculum Vitae
Maria Medalla, Ph.D.
Department of Anatomy and Neurobiology
Boston University School of Medicine
72 E Concord St 10th floor, Boston, MA, 02118
617-358-1893
mmedalla@bu.edu

Academic Training:

9/2008 Ph.D. Boston University, Boston, MA; Applied Anatomy and Physiology
3/2001 B.S. University of the Philippines, Diliman, Quezon City, Philippines; Biology

Additional Training:

3/2012-7/2015 Post Doc in Neurophysiology, Jennifer Luebke, Boston University School of Medicine, Boston, MA
10/2008-2/2012 Post Doc in Neuroanatomy, Helen Barbas, Boston University, Boston, MA

Academic Appointments:

8/2015-present Assistant Professor in Anatomy and Neurobiology, Boston University School of Medicine, Boston, MA

Honors:

2018 Jack Spivack Emerging Leaders in Neuroscience Award
3/2001 Phi Kappa Phi Honors Society
3/2001 Phi Sigma Biological Honors Society

Teaching Experience and Responsibilities:

Spring 2018 Co-Course Director for Methods in Neuroscience (Co-Course Director, Jean-Jacques Soghomonian)
2017-present Lecturer for PrISM Module Cellular Foundations of Medicine (Module Director: Deborah Vaughan)
2015-present Laboratory Instructor for Medical Histology in several PrISM modules (PrISM Director: Deborah Vaughan):
MS141 PrISM Module Cellular Foundations of Medicine
MS142 PrISM Module Body Structures
MS144 PrISM Modules Medical Neuroscience & Medical Immunology
MS145 PrISM Cardiovascular System
MS146 PrISM Modules GI and Nutrition & Endocrinology and Reproduction
2014-present Laboratory and Discussion Instructor Medical Neuroscience PrISM module (Module Directors, 2014-2016: Jarrett Rushmore and Simone Levy; 2017 Jean-Jacques Soghomonian and Simone Levy)
2014-present Lecturer for Methods in Neuroscience (Course Director, Jean-Jacques Soghomonian)
2014-present Lecturer for Cellular and Systems Neuroscience on the topic of Cortical Physiology (Directors, Douglas Rosene, Jerry Chen, William Eldred)
Fall 2013 Journal Club Facilitator on the topic The Diversity of Cortical Pyramidal Neurons
Fall 2014 Journal Club Facilitator on the topic Inhibitory Neurons in the Cortex
Spr 2004-2011 Lecturer and Teaching Assistant for Neural Systems and for Readings in Neuroscience Courses on the topics of Working Memory and Attentional Systems, and Synaptic Structure in the Cortex (Course Director, Helen Barbas)

Major Mentoring Activities:

Summer 2018 Anastasia Kapitonava, Undergraduate BS CAS, Neuroscience, BU Undergrad Research Opportunity Program (UROP) Awardee

- 2016-2017 Mathias Nittmann, MS Medical Sciences, neuroscience, accepted in medical school
2016-2017 Charles Kopp, MS Medical Sciences, neuroscience, accepted in medical school
2015-2016 Alexander Hsu, MS Anatomy and Neurobiology, neuroscience (co-mentored by Jennifer Luebke), now Ph.D. student in Carnegie Mellon University Computational Neuroscience Program
Summer 2015 Alexandra J Morquette, BUSM Graduate of Medical Sciences STaRs Undergraduate Summer Research Internship Awardee, neuroscience (co-mentored by Jennifer Luebke), a current Columbia University Undergraduate
2013-2014 Joshua Gilman, MS Medical Sciences, neuroscience (co-mentored by Jennifer Luebke), medical student at Rutgers University
2013-2014 Jingyi Wang, MS Anatomy and Neurobiology, neuroscience (co-mentored by Jennifer Luebke), now Ph.D. student in Human Physiology program at Sargent College, Boston University
2012-2013 Brendan Hunt, MS, neuroscience (co-mentored by Jennifer Luebke), now PhD student at the University of Calgary
2011-2012 Seung-Yeon Kim, MS Cognitive and Neural Systems, BU Undergrad Research Opportunity Program (UROP) Awardee, neuroscience (co-mentored by Helen Barbas), now laboratory technician at Massachusetts General Hospital
Summer 2009 Kiran Bhai, BU CELEST NSF High School Summer Research Intern, neuroscience (co-mentored by Helen Barbas), now a student at Duke University

PhD. Dissertation Advisory Committee:

Ajay Uprety (Anatomy and Neurobiology)
Katelyn Trecartin (Anatomy and Neurobiology)
Chelsey LeBlang (Anatomy and Neurobiology)
Chris Lim (Anatomy and Neurobiology)
David Schwain (Anatomy and Neurobiology)

Completed:

Ruiyi Ren (Anatomy and Neurobiology), Completed, 07/06/2018
Eli Shobin (PhD, Graduate Program in Neuroscience), second reader, Completed, 03/16/2018
Sharon O'Neill (PhD, Anatomy and Neurobiology), Completed, 03/15/2018
Mary Orczykowski (PhD, Anatomy and Neurobiology), Completed 07/2017
Roman Loonis (MD-PhD, Anatomy and Neurobiology), Completed 06/2017
Teresa Guillamon-Vivancos (PhD, Anatomy and Neurobiology), chair, Completed, 03/2017
Nadine Heyworth, (PhD, Department of Anatomy and Neurobiology), chair, Completed, 06/2016

Professional Societies: Memberships, Offices, and Committee Assignments:

- 2005-present Member, Society for Neurosciences
2016-present Member, Graduate Education Committee, Department of Anatomy & Neurobiology
2016-present Member, New Faculty Search Committee, Department of Anatomy & Neurobiology

Invited Journal Reviewer:

- 2018-present Journal of Histochemistry and Cytochemistry
2017-present Neurobiology of Aging
2017-present Scientific Reports
2016-present Frontiers Journals
2014-present Cerebral Cortex
2014-present European Journal of Neuroscience

Other Support:

Current:

- 8/2015-7/2019 NIMH R00MH101234 (PI: M. Medalla): Physiology and structure of prefrontal projections to memory and motor circuits Total Direct Cost, \$490,416.
Role: PI
- 9/2018–8/2019 NIH/NIA R56- R56AG059693 (PIs: TL. Moore and M. Medalla) The efficacy of curcumin to facilitate recovery of function in a rhesus monkey model of cortical injury. Total Direct Cost, \$480,278.
Role: Co-PI
- 4/2018-7/2022 NIH/NIA R01-AG059028 (PIs: J. Luebke and P. Hof) Mechanisms of age-related cognitive decline in rhesus monkey Total Direct Cost, \$598,095/year.
Role: Co-Investigator
- 7/2017-7/2019 NIH/NINDS R21-NS102991 (PI: TL. Moore): Exosomes from bone marrow derived mesenchymal stem cells as a restorative treatment in a monkey model of cortical injury Total Direct Cost, \$155,412.
Role: Co-Investigator
- 4/2016-3/2019 CHDI foundation (PI: JI. Luebke and C. Weaver): Empirical and computational analyses of striatal MSNs and FSI and of L5 CPNs in the Q175 and DN17 models. Total Direct Cost, \$598,095
Role: Co-investigator
- 4/2016-4/2020 NIH/NIA R01-AG050471 (PI: B. Wolozin): RNA binding proteins as novel targets in Alzheimers disease, Total Direct Cost, \$314,276
Role: Co-Investigator
- 10/2016-6/2021 RF1-AG054199-01 (PI: Ikezu) Exosome-mediated propagation of pathogenic tau protein Role: Co-Investigator Total Direct Cost, \$1,742,225 ()

Past:

- 4/2015-3/2018 Nancy Lurie Marks Family Foundation (PI: T. Ikezu): Characterization of Microglial Wnt signaling in maternal immune activation-related autism
Role: Co-Investigator
- 8/2013-8/2015 NIMH K99MH101234 (PI: M. Medalla): Physiology and structure of prefrontal projections to memory and motor circuits; K99 phase Total Direct Cost, \$158,288.
- 8/2012-4/2013 NRSA T32 postdoctoral training grant (PI: M. Moss)
- 3/2010-3/2012 CELEST, NSF Science of Learning Center Postdoctoral training grant NSF 0835976 CELEST (PI: Shinn-Cunningham, Ames, Guenther, Sekuler): Center of Excellence in Learning, Education, Science and Technology. Total Direct Cost. \$16,050,000 (3/1/2010-2/28/2016).

Invited Lectures and Conference Presentations:

- 14 October 2018 Excitatory and inhibitory circuit diversity in lateral prefrontal and anterior cingulate cortices. Computational Properties of Prefrontal Cortex 2018. Nashville, TN.
- 15 April 2018 Effects of dietary curcumin on microglia-neuron interactions in middle-aged rhesus monkeys. Spring Brain Conference 2018. Sedona, AZ.

- 22 May 2014 Distinctive properties of glutamatergic synapses in primary visual and lateral prefrontal cortices in primates. Boston University School of Medicine, Department of Anatomy and Neurobiology Seminar Series. Boston, MA.
- 8 Aug 2014 Distinctive structural and functional features of excitatory and inhibitory synapses in primate anterior cingulate and lateral prefrontal cortices. Gordon Research Seminar and Conference on Synaptic Transmission. Waterville Valley, NH, USA, 2014.
- 7 June 2013 Convergence of auditory and cingulate input in frontopolar area 10: synaptic substrate for complex cognition. 17 th International Conference on Cognitive and Neural Systems. Boston, MA.
- 28 Feb 2011 Synaptic structure of anterior cingulate pathways involved in cognitive control, COSYNE workshop on Conflicts and Resolution: an integrative approach to the role of medial frontal cortex in the control of effective choice behavior. Snowbird, UT.
- May 2009 Differential interaction of anterior cingulate cortex with functionally distinct dorsolateral prefrontal areas 46 and 10, 13th International Conference on Cognitive and Neural Systems. Boston, USA.
- May 2007 Differential synaptic interaction of intrinsic prefrontal pathways with calbindin and calretinin -expressing inhibitory neurons in the rhesus monkey. 11th International Conference on Cognitive and Neural Systems. Boston, MA

Bibliography:

Original, Peer Reviewed Articles:

1. Goodliffe JW, Song H, Rubakovic A, Chang W, **Medalla M**, Weaver CM, Luebke JI. Differential changes to D1 and D2 medium spiny neurons in the 12-month-old Q175+/- mouse model of Huntington's Disease. PLoS One. 2018 Aug 17;13(8):e0200626. doi: 10.1371/journal.pone.0200626. eCollection 2018.
2. Guillamon-Vivancos T, Tyler WA, **Medalla M**, Chang WW, Okamoto M, Haydar TF, Luebke JI. Distinct Neocortical Progenitor Lineages Fine-tune Neuronal Diversity in a Layer-specific Manner. Cereb Cortex. 2018 Feb 03.
3. Apicco DJ, Ash PEA, Maziuk B, LeBlang C, **Medalla M**, Al Abdullatif A, Ferragud A, Botelho E, Ballance HI, Dhawan U, Boudeau S, Cruz AL, Kashy D, Wong A, Goldberg LR, Yazdani N, Zhang C, Ung CY, Tripodis Y, Kanaan NM, Ikezu T, Cottone P, Leszyk J, Li H, Luebke J, Bryant CD, Wolozin B. Reducing the RNA binding protein TIA1 protects against tau-mediated neurodegeneration in vivo. Nat Neurosci. 2018 Jan;21(1):72-80. doi: 10.1038/s41593-017-0022-z. Epub 2017 Nov 20.
4. **Medalla M**, Gilman JP, Wang JY, Luebke JI. Strength and Diversity of Inhibitory Signaling Differentiates Primate Anterior Cingulate from Lateral Prefrontal Cortex. J Neurosci. 2017 May 3;37(18):4717-4734. doi: 10.1523/JNEUROSCI.3757-16.2017. Epub 2017 Apr 5.
5. Hsu A, Luebke JI, **Medalla M**. Comparative ultrastructural features of excitatory synapses in the visual and frontal cortices of the adult mouse and monkey. J Comp Neurol. 2017 Jun 15;525(9):2175-2191. doi: 10.1002/cne.24196. Epub 2017 Mar 26.
6. Hilgetag CC, **Medalla M**, Beul S, and Barbas H (2016) The primate connectome in context: Principles of connections of the cortical visual system. Neuroimage 2016 Apr 12. pii: S1053-8119(16)30050-7. doi: 10.1016/j.neuroimage.2016.04.017. [Epub ahead of print]. PMID: 27083526

7. Gilman JP*, **Medalla M***, Luebke JI. (2016) Area-Specific Features of Pyramidal Neurons-a Comparative Study in Mouse and Rhesus Monkey. *Cereb Cortex*. 2016 Mar 10. pii: bhw062. [Epub ahead of print] PMID: 26965903 *co-first authors
8. Asai H, Ikezu S, Tsunoda S, **Medalla M**, Luebke JI, Haydar T, Wolozin B, Butovsky O, Kügler S & Ikezu T (2015), Depletion of microglia and inhibition of exosome synthesis halt tau propagation. *Nat Neurosci*. 2015 Oct 5. doi: 10.1038/nn.4132. [Epub ahead of print]. PMID: 26436904
9. Tyler B, **Medalla M**, Guillamon-Vivancos T, Luebke J and Haydar T. (2015) Distinct iPC lines give rise to different populations of layer 2/3 pyramidal cells in the mouse neocortex. *J Neurosci*. 2015 Apr 15;35(15):6142-52. doi: 10.1523/JNEUROSCI.0335-15.2015. PMID: 25878286
10. **Medalla M** and Luebke, JI. (2015) Diversity of glutamatergic synaptic strength in lateral prefrontal versus primary visual cortices in the rhesus monkey. *J Neurosci*, 2015 Jan 7; 35(1):112-27. doi: 10.1523/JNEUROSCI.3426-14.2015. PMID: 25568107
11. Luebke JI, **Medalla M**, Amatrudo JM, Weaver CM, Crimins JL, Hunt B, Hof PR, Peters A. (2013) Age-Related Changes to Layer 3 Pyramidal Cells in the Rhesus Monkey Visual Cortex. *Cereb Cortex*. 2013 Dec 8. [Epub ahead of print]. PMID: 24323499
12. **Medalla M** and Barbas H. (2012) The anterior cingulate cortex may enhance inhibition of lateral prefrontal cortex via m2 cholinergic receptors at dual synaptic sites. *J Neurosci*. 2012 Oct 31; 32(44):15611-25. PMID: 23115196
13. **Medalla M** and Barbas H. (2010) Anterior cingulate synapses in prefrontal areas 10 and 46 suggest differential influence in cognitive control. *J Neurosci*. 30(48):16068-81. PMID: 21123554
14. **Medalla M** and Barbas H. (2009) Synapses with inhibitory neurons of cortex associated with working memory differentiate anterior cingulate from dorsolateral prefrontal pathways. *Neuron* 61: 609-20. PMID: 19249280
15. **Medalla M**, Lera P, Feinberg M, Barbas H. (2007) Specificity in inhibitory systems associated with prefrontal pathways to temporal cortex in primates. *Cereb Cortex* 17 Suppl 1: i136-i150. PMID: 17725996
16. **Medalla M** and Barbas H. (2006) Diversity of laminar connections linking periarculate and lateral intraparietal areas depends on cortical structure. *Eur J Neurosci* 23: 161-179. PMID: 16420426
17. Barbas H, **Medalla M**, Alade O, Suski J, Zikopoulos B, Lera P. (2005) Relationship of prefrontal connections to inhibitory systems in superior temporal areas in the rhesus monkey. *Cereb Cortex* 15: 1356-1370. PMID:15635060

Case Reports, Reviews, Chapters, and Editorials:

Proceedings of Meetings and Invited Papers:

1. **Medalla M**, Barbas H. (2014) Specialized prefrontal "auditory fields": organization of primate prefrontal-temporal pathways. *Front Neurosci*. 2014 Apr 16;8:77. doi: 10.3389/fnins.2014.00077. eCollection 2014. Review. PMID: 24795553

Textbook Chapters:

1. Barbas H, Bunce JG, and **Medalla M**. (2012) Prefrontal pathways that control attention. Review Chapter. In: Stuss, DT, Knight RT, editors. *Principles of Frontal Lobe Development*, Second Edition.