

Silvio Macías

silvio.macias727@gmail.com

116 West University Parkway, Apt. 1118, Baltimore, MD, 21210, (443)-447-2800

CURRICULUM VITAE

EDUCATION

- 2004-2009 Graduate studies in Biological Sciences, Ph.D. awarded 2009
Faculty of Biology, University of Havana, Cuba.
Supervisors: Prof. Dr. Emanuel C. Mora and Prof. Dr. Manfred Kössl
Dissertation: *Specializations in the echolocation system of the bat Molossus molossus (Chiroptera, Molossidae).*
- 2001-2003 MSc Animal Physiology with major in Neurobiology.
Faculty of Biology, University of Havana (highest honors).
- 1996-2001 BSc Biology with major in Animal Physiology.
Faculty of Biology, University of Havana (highest honors).

PROFESSIONAL APPOINTMENTS / EMPLOYMENTS

- 2018-present Postdoctoral Fellow, Department of Biology, Texas A&M University.
- 2016-2018 Postdoctoral Fellow, Department of Psychological and Brain Sciences, Johns Hopkins University.
- 2014-2016 Postdoctoral Fellow, Institute of Cell Biology and Neuroscience, Goethe University Frankfurt am Main, Frankfurt am Main, Germany.
- 2009-2013 Instructor, Department of Animal and Human Biology, University of Havana, Cuba. Coordinator of the Master in Sciences Program in Animal Physiology, University of Havana.
- 2007-2009 Research Scientist, Department of Animal and Human Biology, Faculty of Biology, University of Havana, Cuba.
- 2001-2007 Research Scientist, Department of Basic Sciences, Faculty of Psychology, University of Havana, Cuba.

PEER-REVIEWED PUBLICATIONS

- Hechavarría JC, Beetz MJ, **Macías S**, Kössl M (2016) Vocal sequences suppress spiking in the bat auditory cortex while evoking concomitant steady-state local field potentials. *Scientific Reports*, 6:39226.
- Macías S**, Hechavarría JC (2016) Short delays and low pulse amplitudes produce widespread activation in the target-distance processing area of auditory cortex of the mustached bat. *Journal of the Acoustical Society of America*, 140: 917–923.
- Macías S**, Hechavarría JC, Kössl M (2016) Sharp temporal tuning in the bat auditory midbrain overcomes spectral-temporal trade-off imposed by cochlear mechanics. *Scientific Reports*, 6:29129.
- Moreno C, Sánchez L, **Macías S**, Mora EC (2016) Can echolocation calls of Cuban mormopid bats visualized through a heterodyne system? *Caribbean Journal of Sciences*, 49:27-37.
- Hechavarría JC, Beetz MJ, **Macías S**, Kössl M (2016) Distress vocalization sequences broadcasted by bats carry redundant information. *Journal of Comparative Physiology A*, 202: 503-515.
- Macías S**, Mora EC, Hechavarría JC, Kössl M (2016) Echo-level compensation and delay tuning in the auditory cortex of the mustached bat. *European Journal of Neuroscience*, 43: 1647-1660.

Silvio Macías

silvio.macias727@gmail.com

116 West University Parkway, Apt. 1118, Baltimore, MD, 21210, (443)-447-2800

Macías S, Hechavarría JC, Kössl M (2016) Temporal encoding precision of bat auditory neurons tuned to target distance deteriorates on the way to the cortex. *Journal of Comparative Physiology A*, 202: 195-202.

Macías S, Hernández-Abad A, Hechavarría JC, Kössl M, Mora EC (2015) Level-tolerant duration selectivity in the auditory cortex of the velvety free-tailed bat *Molossus molossus*. *Journal of Comparative Physiology A*, 201: 461-470.

Macías S, Hechavarría JC, Cobo A, Mora EC (2014) Narrow sound pressure level tuning in the auditory cortex of the bats *Molossus molossus* and *Macrotus waterhousii*. *Hearing Research*, 309: 36-43.

Kössl M, Hechavarría JC, Voss C, **Macías S**, Mora EC, Vater M (2014) Neural maps for target range in the auditory cortex of echolocating bats. *Current Opinion in Neurobiology*, 24: 68-75.

Hechavarría JC, **Macías S**, Vater M, Voss C, Mora EC, Kössl M (2013) Blurry topography for precise target-distance computations in the auditory cortex of echolocating bats. *Nature Communications*, 4: 2587.

Mora EC, **Macías S**, Hechavarría JC, Vater M, Kössl M (2013) Evolution of the heteroharmonic strategy for target-range computation in the echolocation of Mormoopidae. *Frontiers in Physiology*, 4(141): 1-13.

Macías S, Hechavarría JC, Mora EC, Kössl M (2013) Neurons in the inferior colliculus of the mustached bat are tuned both to echo-delay and sound duration. *Neuroreport*, 24: 404-409.

Hechavarría JC, **Macías S**, Vater M, Mora EC, Kössl M (2013) Evolution of neuronal mechanisms for echolocation: Specializations for target-range computation in bats of the genus *Pteronotus*. *Journal of the Acoustical Society of America*, 133: 570-578.

Kössl M, Voss C, Mora EC, **Macías S**, Foeller E, Vater M (2012) Auditory cortex of newborn bats is prewired for echolocation. *Nature Communications*, 3: 773.

Macías S, Mora EC, Hechavarría JC, Kössl M (2012) Properties of echo delay-tuning receptive fields in the inferior colliculus of the mustached bat. *Hearing Research*, 286: 1-8.

Mora EC, **Macías S** (2011) Short CF-FM and FM-short CF calls in the echolocation behavior of *Pteronotus macleayii* (Chiroptera: Mormoopidae). *Acta Chiropterologica*, 13: 457-463.

Macías S, Mora EC, Hechavarría JC, Kössl M (2011) Duration tuning in the inferior colliculus of the mustached bat. *Journal of Neurophysiology*, 106: 3119-3128.

Hechavarría JC, Cobo A, Fernández Y, **Macías S**, Kössl M, Mora EC (2011) Sound-evoked oscillation and paradoxical latency shift in the inferior colliculus neurons of the big fruit-eating bat, *Artibeus jamaicensis*. *Journal of Comparative Physiology A*, 197: 1159-1172.

Mora EC, Ibáñez C, **Macías S**, Juste J, López I, Torres L (2011) Plasticity in the echolocation inventory of *Mormopterus minutus* (Chiroptera, Molossidae). *Acta Chiropterologica*, 13: 179-187.

Macías S, Mora EC, Kössl M, Abel C, Foeller E (2009) The auditory cortex of the bat *Molossus molossus*: Disproportionate search call frequency representation. *Hearing Research*, 250: 19-26.

Macías S, Mora EC (2006) variability in the echolocation behavior of the big fruit-eating bat *Artibeus jamaicensis parvipes* (Chiroptera: Phyllostomidae) in Cuba. *BIOLOGÍA*, 20: 24-29.

Mora EC, **Macías S** (2007) Echolocation calls of Poey's flower bat (*Phyllonycteris poeyi*) unlike those of other phyllostomids. *Naturwissenschaften*, 94: 380-383.

Silvio Macías

silvio.macias727@gmail.com

116 West University Parkway, Apt. 1118, Baltimore, MD, 21210, (443)-447-2800

Macías S, Mora EC, García A, Macías Y (2006) Echolocation behavior of *Brachyphylla nana* (Chiroptera: Phyllostomidae) under laboratory conditions. *Caribbean Journal of Science*, 42: 114-120.

Macías S, Mora EC, Coro F, Kössl M (2006) Threshold minima and maxima in the behavioral audiograms of the bats *Artibeus jamaicensis* and *Eptesicus fuscus* are not produced by cochlear mechanics. *Hearing Research*, 212: 245-250.

Macías S, Mora EC, García A (2006) Acoustic identification of mormoopid bats: a survey during the evening exodus. *Journal of Mammalogy*, 87: 324-330.

Macías S, Mora EC, Koch C, von Helversen O (2005) Echolocation behaviour of *Phyllops falcatus* (Chiroptera: Phyllostomidae): unusual frequency range of the first harmonic. *Acta Chiropterologica*, 7: 275-283.

Mora EC, Rodríguez A, **Macías S**, Quiñonez I, Mellado M (2005) The echolocation behaviour of *Nycticeius cubanus* (chiroptera: vespertilionidae): inter- and intra-individual plasticity in vocal signatures. *Bioacoustics*, 15: 175-193.

Mora EC, **Macías S**, Vater M, Coro F, Kössl M (2004) Specializations for aerial hawking in the echolocation system of *Molossus molossus* (Molossidae, Chiroptera). *Journal of Comparative Physiology A*, 190: 561-574.

Macías S, Mora EC (2003) Variation of echolocation calls of *Pteronotus quadridens* (Chiroptera: Mormoopidae) in Cuba. *Journal of Mammalogy*, 84: 1428-1436.

Mora EC, **Macías S**, Rojas D, Rodríguez A, Quiñonez I, García A, Cádiz A, Boburg B (2002) Aplicación de métodos bioacústicos y convencionales en la caracterización de la comunidad de murciélagos de la cueva del indio, Tapaste, La Habana, Cuba. *BIOLOGÍA*, 16: 159-166.

AWARDS AND HONORS

- 2014 Georg Forster Fellowship for Experienced Researchers of the Alexander von Humboldt Foundation.
- 2013 Annual Award of the Cuban Academy of Sciences.
- 2012 Developing Neuroethology Award from the International Society for Neuroethology.
- 2012 Neural System and Behavior course, Marine Biological Laboratory, Woods Hole, Massachusetts.
- 2012 Elected Young Member of the Cuban Academy of Science.
- 2012 Awarded as Best Young Instructor at Havana University.
- 2011 Awarded as Best Young Instructor at Havana University.
- 2010 Latin-American School of Neuroethology IBRO Travel Grant, Buenos Aires, Argentina.
- 2010 Awarded as the Best PhD Thesis in the field of Natural Sciences in Cuba.
- 2009 Awarded as Best Young Instructor at the Faculty of Biology, Havana University.
- 2008 German Academic Exchange Service (DAAD) Fellowship, Institute of Cell Biology and Neuroscience, Goethe University Frankfurt am Main, Germany.
- 2007 German Academic Exchange Service (DAAD) Fellowship, Institute of Cell Biology and Neuroscience, Goethe University Frankfurt am Main, Germany.
- 2007 Cuban Academy of Science Annual Award
- 2005 Society for Neuroscience Annual Meeting Travel Grant
- 2004 Ricardo Miledi Latin-American Training Program in Neuroscience Travel Grant, Institute of Neurobiology, Mexico.

INVITED TALKS AND SEMINARS

- 2015 Center for System Neuroscience, Hannover, Germany.
- 2014 Institute of Cell Biology and Neuroscience, Universidad J.W. Goethe, Frankfurt, Germany.
- 2012 Center for System Neuroscience, Hannover, Germany.

Silvio Macías

silvio.macias727@gmail.com

116 West University Parkway, Apt. 1118, Baltimore, MD, 21210, (443)-447-2800

- 2012 Department of Neurobiology, Cornell University, USA.
- 2008 Institute of Cell Biology and Neuroscience, Universidad J.W. Goethe, Frankfurt, Germany.
- 2007 Faculty of Sciences, Universidad de Chile, Santiago de Chile, Chile.
- 2007 Faculty of Medicine, Universidad de Valparaiso, Valparaiso, Chile.
- 2007 Faculty of Medicine, Universidad Austral de Chile, Valdivia, Chile.
- 2007 Institute of Cell Biology and Neuroscience, Universidad J.W. Goethe, Frankfurt, Germany.
- 2005 Cornell Lab of Ornithology, Cornell University, Nueva York, USA.
- 2005 Institute de Zoology, Universidad J.W. Goethe, Frankfurt, Germany.
- 2005 EARTH University, Department of Limón, Costa Rica.
- 2004 Institute of Zoology, Universidad J.W. Goethe, Frankfurt, Germany.

TEACHING

- 2011,2013 Teaching assistant: Graduate course: 1st IBRO-LARC Caribbean school of Neuroethology.
- 2011-2013 Instructor: Graduate course: "Cell Physiology and Biophysics", Faculty of Biology, University of Havana, Cuba.
- 2007-2013 Instructor: Undergraduate course: "Animal Physiology", Full semester, Faculty of Biology, University of Havana, Cuba.
- 2001-2013 Instructor: Undergraduate course: "Comparative Animal Physiology", Full semester, Faculty of Biology, University of Havana, Cuba.
- 2001-2009 Instructor: Undergraduate course: "Biophysics", Full semester, Faculty of Biology, University of Havana, Cuba.
- 2001-2007 Instructor: Undergraduate course: "Biological Basis of Behavior", Full semester, Faculty of Psychology, University of Havana, Cuba.

Academic advising

- 2011-2012 Co-advisor for an undergrad thesis opting for a BSc Biology "Effect of the frequency of the echo and the intensity of the call on cortical delay-tuned neurons in the bat *Pteronotus quadridens*."
- 2010-2011 Co-advisor for an undergrad thesis opting for a BSc Biology "Echo-delay selectivity in neurons of the auditory cortex of *Pteronotus quadridens* (Mormoopidae, Chiroptera)."
- 2003-2004 Co-advisor for an undergrad thesis opting for a BSc Biology "Acoustic identification of eight species of Cuban bats: a tool for studying the evening exodus of cave-dwelling bats."

PROFESSIONAL SERVICES

Reviewer for the Journal of Comparative Physiology A, Hearing Research, Neuroscience Letters, BIOLOGÍA, Journal of Neuroscience. Associate editor of Frontiers in Physiology.

PROFESSIONAL AFFILIATIONS

International Brain Research Organization (IBRO), International Society for Neuroethology (ISN), Cuban Academy of Sciences, Society for Neuroscience (SfN)

OTHER SKILLS

Languages: English, fluent in reading, speaking and writing
Spanish, native

Silvio Macías

silvio.macias727@gmail.com

116 West University Parkway, Apt. 1118, Baltimore, MD, 21210, (443)-447-2800

Technical Competencies: SigmaPlot, Prism, CorelDraw, *in vivo* electrophysiology, bats handling, sound recording and analysis, MatLab, Otoacoustic emissions recording and analysis, Avisoft.