

# CURRICULUM VITAE

---

**Romulo Antonio Fuentes Flores, PhD**

## Address

Departamento de Neurociencia  
Facultad de Medicina  
Universidad de Chile  
Independencia 1027  
Santiago - Chile  
8389100 - Clasificador 7  
Phone: +56 22 978 6051  
e-mail: [romulo@neuro.med.uchile.cl](mailto:romulo@neuro.med.uchile.cl), [romuloaff@gmail.com](mailto:romuloaff@gmail.com)

## Education

2000 Biochemist, Faculty of Chemistry and Pharmaceutical Sciences,  
University of Chile  
2000 - 2005 Ph.D. Biomedical Sciences, Institute of Biomedical Sciences,  
Department of  
Physiology, Faculty of Medicine, University of Chile  
2006 - 2010 Postdoctoral Fellow, Department of Neurobiology, Duke  
University

## Honors and Awards

1994 Academic Excellence Fellowship. University of Chile  
2000 - 2001 Doctoral Fellowship, Program for Improvement of the Quality  
and Equity in Education MECESUP, Chilean Government  
2002 - 2004 Doctoral Fellowship from the National Council of Science and  
Technology (CONICYT)  
2007 - 2009 Postdoctoral Award, Ruth K. Broad Biomedical Research  
Foundation

## Research Experience and Grants

2016 - 2021 Millennium Brain Neuroscience Institute, Iniciativa Científica  
Milenio, adjunct investigator

- 2015 - 2017 Millennium Nucleus for biology of neuropsychiatric disorders NuMind 130011, Iniciativa Científica Milenio, adjunct investigator
- 2015 - 2018 Close loop neuromodulation of the spinal cord for treatment of Parkinson's disease. Principal Investigator, financed by Conicyt, Fondecyt regular project N° 1151478
- 2010 - 2014 Validation of Dorsal Column Electrical Stimulation as a Target for Parkinson's Disease Therapy in 6-OHDA Non-human Primates. Principal investigator. Funding Agency: Michael J. Fox Foundation for Parkinson's Research (U.S.A).
- 2010 - 2013 Perturbations of corticostriatal activity in alpha-synuclein mammalian models of Parkinson's disease: treatment by dorsal column stimulation. Swiss Brazilian Scientific & Technology Cooperation Fund
- 2010 - 2015 Brain-Machine Interface National Institute of Science And Technology, PI: Miguel Nicolelis, Funding Agency: Brazilian Ministry of Science and Technology
- 2006 - 2010 Postdoctoral research. Stimulation of peripheral nerve afferents for treatment of Parkinson's disease. P.I. Miguel A. L. Nicolelis, Neurobiology Department, Duke University.
- 2002 - 2005 Doctoral Thesis. Characterization of neuronal population activity in the olfactory bulb of behaving animals. P.I. Pedro Maldonado, Faculty of Medicine, University of Chile.
- 1999 - 2001 Undergraduate Thesis. Effects of Repressor Element-1 Silencing Transcription Factor in Expression Pattern of Neural Genes during development. P.I. Manuel A. Kukuljan, Faculty of Medicine, University of Chile.

## Professional Experience

- |                |   |
|----------------|---|
| 2014 - present | Assistant Professor, Faculty of Medicine, University of Chile   |
| 2011 - 2014    | Scientific Director, Edmond and Lily Safra International Institute of Neuroscience of Natal (ELS-IINN)  |
| 2010 - 2011    | Associate Researcher, Edmond and Lily Safra International Institute of Neuroscience of Natal (ELS-IINN) |
| 2010 - 2011    | Assistant Professor, Federal University of Rio do Grande do Norte Natal                                 |
| 2004 - 2005    | Teaching Assistant, Diego Portales University   |
| 2005 - 2006    | Teaching Assistant, University of Chile   |
| 2005 - 2005    | Teaching Assistant, Alberto Hurtado University  |
| 2004 - 2004    | Teaching Assistant, Andres Bello University   |
| 1999 - 2000    | Teaching Assistant, Mayor University  |

## Teaching Experience

2015 – present Teaching Assistant, Cellular Physiology , Facultad de Medicina, Univ. de Chile  
2015 – present Teaching Assistant, Systems Physiology , Facultad de Medicina, Univ. de Chile  
2015 – present Teaching Assistant, Physics Course for Medicine , Universidad de Chile  
2015 – present Teaching Assistant, Physics Course for Occupational Therapy , Universidad de Chile  
2012 Lecturer, Neuromodulation for Graduate School of Neuroscience Federal University of Rio Grande do Norte  
2011 Neurophysiology course, Federal University of Rio Grande do Norte  
2005 – 2006 Teaching Assistant, Physiology, Faculty of Medicine, University of Chile  
2005 – 2005 Teaching Assistant, Science Integration for Medicine, Diego Portales University  
2004 – 2005 Teaching Assistant, Biophysics for Medicine, Diego Portales University  
2005 – 2005 Teaching Assistant, Neurophysiology, Alberto Hurtado University  
2004 – 2004 Teaching Assistant, Neurophysiology, Andres Bello University  
2000 – 2000 Instructor, Biochemistry, Mayor University  
1999 – 1999 Teaching Assistant, Biochemistry, Mayor University

## Administrative Assignments

Coordinator, Mathematics & Physics course for Nursing (2016)  
Professor in charge, Systems Physiology course for Occupational Therapy (2016)  
AASDAP, Internal Biosafety Commission, president (2011- 2014 )

## Research Interests

1. Neuronal basis of sensorimotor functions
2. Electrical stimulation of the nervous system as a therapy for neurological disorders
3. Development of neuromodulation devices for restoring neurological function.

## Peer Review for Scientific Journals

- Plos One
- Revista Ingenieria Biomedica

- The Lancet (North American edition)
- Frontiers in Neuroscience
- Neuromodulation
- Journal of NeuroEngineering and Rehabilitation

## **Advisor positions**

2013 - 2014 Member of the external Scientific Advisory Board for NeuroTREMOR , a project about a novel concept for support to diagnosis and remote management of tremor (Project number: 287739; Institutions: Consejo Superior de Investigaciones Cientificas [CSIC], Hospital 12 de Octubre, University of Maribot, Fraunhofer Institut Biomedizinische Technik, Ossur, Columbia University).

## **Supervised Postdoctoral Fellows and Students**

### *Ph.D. Graduate Students*

- Maxwell Santana (2010 - 2013)
- Ivani Brys (2011 - 2014)

### *Undergraduate students*

- Jessica Nunes (2013 - 2014)
- Pollyanna Schneider (2013 - 2013 )

## **Published Papers**

1. Fuentes R, Armisen R, Olguín P, Cabrejos ME, Kukuljan M. Repressor element-1 silencing transcription/neuron-restrictive silencer factor is required for neural sodium channel expression during development of Xenopus. J Neurosci 22: 8347-51, 2002.
2. Valdes J, Maldonado P, Recabarren M, Fuentes R, Torrealba F. The infralimbic cortical area commands the behavioral and vegetative arousal during appetitive behavior in the rat. European J Neurosci 23: 1352-64, 2006.

3. Fuentes R, Aguilar M, Aylwin ML, Maldonado P. Neuronal activity of mitral-tufted cells in awake rats during passive and active odorant stimulation. *J Neurophysiol* 100:422-30, 2008
4. Fuentes R, Petersson P, Siesser WB, Caron MG, Nicoletis MAL. Spinal Cord Stimulation Restores Locomotion in Animal Models of Parkinson's disease. *Science* 323:1578-82, 2009
5. Fuentes R, Petersson P, Nicoletis MA. Restoration of locomotive function in Parkinson's disease by spinal cord stimulation: mechanistic approach. *Eur J Neurosci.* 32:1100-8, 2010
6. Dzirasa K, Fuentes R, Kumar S, Potes JM, Nicoletis MA. Chronic in vivo multi-circuit neurophysiological recordings in mice. *J Neurosci Methods.* 195:36-46, 2011
7. Yadav AP, Fuentes R, Zhang H, Vinholo T, Wang C-H, Nicoletis MAL. Chronic Spinal Cord Stimulation Protects against 6-hydroxydopamine Lesions. *Sci. Rep.* 4:3839, 2014
8. Maxwell B. Santana, Pär Halje, Hougelle Simplício, Ulrike Richter, Marco Aurelio M. Freire, Per Petersson, Romulo Fuentes, and Miguel A.L. Nicoletis. Spinal cord stimulation desynchronizes cortico-basal ganglia circuits and alleviates motor symptoms in a primate model of Parkinson's disease. *Neuron* 84, 1-7 Nov 19, 2014 \* Shared senior authorship with Petersson and Nicoletis
9. Maxwell Santana; Tobias Palmér; Hougelle Simplício; Romulo Fuentes; Per Petersson. Characterization of long-term motor deficits in the 6-OHDA model of Parkinson's disease in the common marmoset. *Behavioural Brain Research* 290: 90 -101, 2015
10. de Andrade EM, Ghilardi MG, Cury RG, Barbosa ER, Fuentes R, Teixeira MJ, Fonoff ET. Spinal cord stimulation for Parkinson's disease: a systematic review. *Neurosurg Rev.*, 2015
11. Brys, I., Bobela, W., Schneider, B. L., Aebischer, P., & Fuentes, R. (2016). Spinal cord stimulation improves forelimb use in an alpha-synuclein animal model of Parkinson's disease. *International Journal of Neuroscience*, 7454(March), 1-9, 2016
12. Brys, I., Nunes, J. and Fuentes, R. (2017), Motor deficits and beta oscillations are dissociable in an alpha-synuclein model of Parkinson's disease. *Eur J Neurosci.* doi:10.1111/ejn.13568

## Invited Articles and Book Chapters

1. Wojtecki L, Colosimo C, Fuentes R. Deep brain stimulation for movement disorders - a history of success and challenges to conquer. *Front Integr Neurosci.* 2012;6:6.
2. Juan Pablo Romero Muñoz, Francisco Rivas, Ilaria Fojadelli, Romulo Fuentes. Chapter: “*Spinal Cord Stimulation for Parkinson's Disease*” in *Emerging Therapies in Neurorehabilitation*, J.L Pons and D. Torricelli eds, Biosystems & Biorobotics, Vol. 4, DOI: 10.1007/978-3-642-38556-8\_3, ©Springer-Verlag Berlin Heidelberg 2014
3. Entry “Spinal Stimulation for Parkinson Treatment” for *Encyclopedia of Computational Neuroscience*, edited by Dieter Jaeger and Ranu Jung, Springer Reference editions. 2847-2848

## Abstracts Presented at International Meetings

1. Armisén R.; Fuentes R.A.; Mandel G.; Kukuljan. M. Expression of REST and neuronal sodium channels during the early development of *Xenopus laevis*. Society for Neuroscience Annual Meeting, New Orleans, LA, 2000.
2. Armisén R.; Fuentes R.A.; Olguín P.; Kukuljan. M. . REST: An activator of neural specific gene expression? PEW Latin American Fellows Program in the Biomedical Sciences Tenth Anniversary Reunion, Cancun, Mexico, 2000.
3. Fuentes R.A.; Aguilar M.; Aylwin M.L.; Maldonado P.E. Neural activity from olfactory bulb in rats performing a two-odorant discrimination task. Society for Neuroscience Annual Meeting, San Diego, CA, 2004.
4. Fuentes R.A.; Takahashi D.Y.; Nicolelis M.A.L. . Primary motor cortex and dorsolateral striatum exhibit a decrease in global coherence, but not in partial directed coherence, during dopamine depletion. Society for Neuroscience Annual Meeting, San Diego, CA, 2007 (online).
5. Fuentes R.A.; Petersson P.; Nicolelis, M.A.L. . Electrical stimulation of dorsal column restores locomotion in rodent models of Parkinson’s disease. Society for Neuroscience Annual Meeting, Washington, DC, 2008.
6. Nicolelis MAL, Montenegro D, Alves D, Badiali IF, Silva EL, Porto JA, Fuentes R. Scientists of the Future Program: getting started in

- neuroscience in high school. In: Society for Neuroscience, 2011, Washington.
7. Savoldi R., Janner D. R., Brys I., Fuentes R. A. , Montenegro D., Nicolelis M. A. L. Scientists of the Future Program: getting started in neuroscience in high school, In: Society for Neuroscience, 2012, New Orleans.
  8. Santana, M. ; Morya, E ; Savoldi, R. ; Brys, I. ; Kunicki, A. C. B. ; Fuentes, R. ; Nicolelis, Miguel A. L. . Introduction to manual video behavior analysis as a neuroscience trigger to young students. In: Society for Neuroscience, 2012, New Orleans.
  9. Kunicki, A. C. B. ; Savoldi, R. ; Santana, M. ; Brys, I. ; Lehew, G. ; Morya, E ; Fuentes, R. ; Nicolelis, M. Building microelectrode arrays: A window to learn brain activity. In: Society for Neuroscience, 2012, New Orleans. Society for Neuroscience, 2012.
  10. Morya, E ; Savoldi, R. ; Freire, Marco Aurelio M. ; Kunicki, A. C. B. ; Santana, M. ; Brys, I. ; Fuentes, R. ; Nicolelis, M. Human brain oscillations: From brain state mapping to clinical applications. In: Society for Neuroscience, 2012, New Orleans. Society for Neuroscience, 2012.
  11. Brys, I. ; Fuentes, R. ; Schneider, B. ; Morya, E ; Pereira, Antonio ; Nicolelis, M.A.L. A chronic animal model of Parkinson's disease based on uni- and bilateral overexpression of  $\alpha$ -synuclein in the substantia nigra. In: Society for Neuroscience, 2012, New Orleans. Society for Neuroscience, 2012.
  12. Kunicki, A. C. B. ; Morya, E ; Fuentes, R. ; Nicolelis, M. Individual learning performance on whisker-dependent tactile discrimination tasks of wistar rats. In: Society for Neuroscience, 2012, New Orleans
  13. Santana M.; Palmér T.; Simplício H.; Pereira A.; Petersson P.; Fuentes R.; Nicolelis M.A.L. Quantitative evaluation of motor impairment in the common marmoset after the two stage injection of 6-hydroxydopamine. In: Society for Neuroscience, 2012, New Orleans
  14. Yadav A.P.; Fuentes R.; Zhang H.; Vinholo T.; Wang C.-H.; Nicolelis M.A.L. Long-term spinal cord stimulation improves motor function, accelerates weight recovery and protects against dopaminergic neurodegeneration in a rodent model of Parkinson's Disease. In: Society for Neuroscience, 2012, New Orleans
  15. Fuentes R. A.; Petersson P.; Santana M. B.; Simplicio H.; Palmer T.; Nicolelis M. A. L. Spinal cord stimulation restores motor function in a

- primate model of Parkinson's disease. In: Society for Neuroscience, 2012, New Orleans
16. R. A. Fuentes, P. Petersson, M. B. Santana, H. Simplício, T. Palmer, M. A. L. Nicolelis Effects of spinal cord stimulation on the neuronal firing rate and synchronization of the cortico-basal-thalamic circuit in a primate model of Parkinson's disease. In: Society for Neuroscience, 2013, San Diego
  17. Kunicki, A. C. B.; Fuentes, R.; Nicolelis, M. Morya, E. Somatosensory cortex neuronal firing rates during active tactile discrimination in rats. In: Society for Neuroscience, 2013, San Diego
  18. Ivani Brys, Bernard Schneider, Miguel Nicolelis, Romulo Fuentes Chronic Spinal Cord Stimulation alleviates motor asymmetry in an alpha-synuclein animal model of Parkinson Disease. In: Society for Neuroscience, 2013, San Diego
  19. Vinholo, T; Santana, M.B.; Freire, M.; Araújo, M.F.P; Simplício, H.; Schneider, B., Fuentes, R.; Nicolelis, M.A.L. Expression efficiency of rAAV6 and rAAV9 serotypes in the ventral midbrain of common marmosets. In: Society for Neuroscience, 2013, San Diego
  20. Mariana F. P. de Araujo, Renan C. Moiollo, Fabrício Brasil. Romulo Fuentes, Miguel A. L. Nicolelis. Analysis of local field potentials in a common marmoset (*Callithrix jacchus*) during rest and locomotion. In: Society for Neuroscience, 2013, San Diego
  21. Pär Halje, Maxwell Santana, Hougelle Simplício, Miguel Nicolelis, Romulo Fuentes, Per Petersson. Effects of spinal cord stimulation on the neuronal population dynamic of the cortico-basal ganglia-thalamic circuit in a primate model of Parkinson's disease. In: Society for Neuroscience, 2013, San Diego
  22. P. Petersson, P. Halje, M. Santana, R. Fuentes, M. A. L. Nicolelis. A method for characterization of activity patterns in cortico-basal ganglia-thalamic structures related to reaching in a primate model of Parkinson's disease. In: Society for Neuroscience, 2013, San Diego
  23. Ulrike Richter, Pär Halje, Maxwell Santana, Miguel Nicolelis, Romulo Fuentes and Per Petersson. Functional coupling in the cortico-basal ganglia-thalamic loop in a primate model of Parkinson's disease. In: Society for Neuroscience, 2013, San Diego



24. R. A. Fuentes, M. Santana, P. Halje, H. Simplicio, U. Richter, M. Freire, P. Petersson, M. Nicoletis. Spinal cord stimulation alleviates motor symptoms and decreases beta oscillatory activity in bilateral 6-OHDA marmosets. In: Society for Neuroscience, 2014, Washington DC
25. I. Brys, R. Fuentes, J. Nunes, B. Schneider, P. Aebischer, M. A. L. Nicoletis. Underlying mechanisms from motor symptoms of the Alpha-synuclein Parkinson's disease rat model. In: Society for Neuroscience, 2014, Washington DC

## Selected Invited Presentations

- 2015 VIII Congreso Iberoamericano de Tecnologías de Apoyo a la Discapacidad (Iberdiscap 2015), Punta Arenas, Chile
- 2015 Congreso del Futuro 2015, Santiago, Chile
- 2014 International Workshop of Biomedical Engineering, UFES, Vitoria, Espirito Santo, Brazil
- 2014 Michael J. Fox Foundation Parkinson's Disease Therapeutics Conference, New York
- 2012 Summer School on Neurorehabilitation - Zaragoza, Spain
- 2012 Departamento de Fisiología de la Pontificia Universidad Católica de Chile
- 2012 VII Reunião Regional da Federação de Sociedades de Biologia Experimental - Maceió, Alagoas
- 2011 Summer School on Neurorehabilitation - Salamanca, Spain
- 2011 Neuromodulation Congress - Groningen, Netherlands
- 2010 Educational symposium of the Parkinson Association of the Carolinas - Lancaster, North Carolina
- 2010 Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (Cinvestav) - Mexico City, Mexico
- 2009 University of North Carolina - Chapel Hill, North Carolina

## Languages

- Spanish (native)
- English (advanced level)
- Portuguese (advanced level)
- Russian (beginner level)
- Swedish (beginner level)