

## BIOGRAPHICAL SKETCH Resume 2016

<b>NAME</b> Palacios, Adrián Chilean Nationality Married 1 child <a href="http://cinv.uv.cl/apalacios">http://cinv.uv.cl/apalacios</a> <a href="http://www.sistemascomplejos.cl">http://www.sistemascomplejos.cl</a> email: <a href="mailto:adrian.palacios@uv.cl">adrian.palacios@uv.cl</a>		<b>POSITION TITLE</b> Professor Universidad de Valparaíso Centro Interdisciplinario de Neurociencia de Valparaíso Facultad de Ciencias Chile	
<b>EDUCATION</b>			
<b>INSTITUTION</b>	<b>DEGREE</b>	<b>YEAR</b>	<b>FIELD</b>
Sorbonne University Paris V	BS	1982	Psychology
Pierre et Marie Curie Univ Paris VI	PhD	1991	Neuroscience
<b>APPOINTMENT</b>			
Yale University (TH Goldsmith Lab)	Postdoctoral / Research Assistant	1991-1996	Biophysics
Harvard University (John Dowling Lab)	Visiting Researcher	2001 (Jan-March)	Sensory Neuroscience
Ecole Polytechnique CREA -CNRS	Visiting Researcher	2008-2010	Computational Neurosciences
INRIA-CORTEX Henri Poincare University Nancy II	Visiting Researcher	2008-2010	Computational Neurosciences

### Position and Honors

#### Positions and Employment

2015- Research Director, Universidad de Valparaíso,

1996- Professor, Neuroscience, Faculty of Science, Universidad de Valparaíso, Chile.

2006-2007 Postgraduate Coordinator, Faculty of Science, Universidad de Valparaíso, Chile.

#### Other Experience and Professional Memberships

- 2015- Editor Asociado, Sección Neurociencia, Biological Research.
- 2014- Membre Correspondant International de la revue Intellectica de l'Association pour la Recherche sur la Cognition (ARCo) <http://intellectica.org>
- 2013- Faculty member Graduate Program in Complex Systems, Universidad Adolfo Ibanez.
- 2013- Faculty member Graduate Program in Science, Molecular and Cellular Biology and Neuroscience. Universidad de Chile.
- 2013- Journal on Policy and Complex Systems. Board Member. <http://www.ipsonet.org/publications/open-access/policy-and-complex-systems>
- 2013-2015 Vicepresidente, Sociedad Chilena de Neurociencia, Chile
- 2010. External reviewer (Simon Fraser U, Canada)
- 2002-2007. Head of the Neuroscience Ph.D. Program, Universidad de Valparaíso, Chile.
- 2005-2007; 2013-2015. Vice president, Chilean Neuroscience Society, Chile
- 2003- Neurosciences French Society, France
- 2000-2002 Head of Master degree in Neuroscience, Universidad de Valparaíso, Chile.
- 2002- Animal Behavior Society, USA
- 2001- Journal Associate Editor, Biological Research
- 2000- The International Society for Neurochemistry, USA
- 1993- Chilean Physiological Society
- 1991- Society for Neuroscience, USA
- 1991- Editor Associate, Behavioral Brain Sciences,
- 1990- Reviewer: Proceeding of the Royal Society, Behavioral Brain Sciences (BBS), Journal Comparative Physiology A, Vision Research, Visual Neurosciences, Biological Research, North American Journal of Fisheries

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Management, Evolutionary Ecology Research, Journal Experimental Biology, Marine and Freshwater Behaviour and Physiology, Journal of Neuroscience.

### **Editor**

2013 Neural coding and Natural image Statistics, Journal of Physiology Paris. Special Edition.

2011 Palacios A, Cohen-Varela A. La ciencia del ser: Las rutas de Francisco Varela. Editorial Universidad de Valparaíso. 320 p.

2007 Trends in Cognitive Sciences *Biological Research*, Special edition

2003 Tribute to Francisco Varela *Biological Research*, Special edition

### **Honors and Positions**

2010 Invited Professor Nancy II, INRIA CORTEX, February-April

2009 Invited Researcher INRIA CORTEX October-December

2009 Invited Professor Henri Poincare University (Nancy I), INRIA CORTEX January

2008 Invited Researcher INRIA CORTEX November-December

2003- Senior Investigator. *Instituto de Sistemas Complejos de Valparaíso*, Chile ISCV

### **International and Domestic Ongoing Collaborations:**

Monica Acosta [U of Auckland]; Alfredo Kirkwood [Johns Hopkins U]; Bruno Cessac, Thierry Vieville, Frederic Alexander [INRIA, France]; Maria Jose Escobar [UTSFM]; Nivaldo Inestrosa [PUC]; Claudio Hetz [UCHILE].

### **Publications (Articles last years-)**

1. Martinez-Harms J, Palacios A.G., Marquez N., Arroyo M.T.K. and Mpodozis J. (2010) Can red flowers be conspicuous to bees?: *Bombus dahlbomii* and South American temperate forests flowers as a case in point. *Journal Experimental Biology* 213: 564-571. Featured in: Inside JEB: Bees Use Achromatic Contrast To See Red. Kathryn Knight *Journal of Experimental Biology* 213, ii (2010)
2. Palacios AG, Bozinovic F, Vielma A, Arrese CA, Hunt DM, Peichl L (2010) Retinal Photoreceptor Arrangement, SWS1 and LWS Opsin Sequence, and Electroretinography in the South American Marsupial *Thylamys elegans* (Waterhouse, 1839). *J Comp Neurol* 518(9):1589-1602.
3. Schleich C, Vielma A, Palacios AG, Peichl L. (2010) The Retinal Photoreceptors of Two Subterranean Tuco-tuco Species (Rodentia, Ctenomys): Morphology, Topography and Spectral Sensitivity. *J Comp Neurol.* 518(19): 4001–4015,
4. Vielma A, Delgado LM, Elgueta C, Palacios AG and Schmachtenberg O. (2010). Nitric oxide amplifies the rod response of the rat retina, measured by electroretinography. *Experimental Eye Research.* 91(5):700-9.
5. Muñoz P, Aspé M, Contreras LS, and Palacios AG. (2010) Role of DNA methylation during recognition memory in hippocampus and perirhinal cortex in rats. *Biological Research:* 43(2):251-258.
6. Braidy N, Muñoz P, Palacios AG, Castellano-Gonzalez G, Inestrosa NC, Chung RS, Sachdev P, Guillemain GJ. (2012). Recent Animal Models For Alzheimer's Disease: Clinical Implications And Basic Research. *Journal of Neural Transmission* 119(2):173-195.
7. Vasquez JC, Palacios AG, Marre O, Berry II MJ, Cessac B. (2012). Gibbs distribution analysis of temporal correlation structure on multicell spike trains from retina ganglion cells. *Journal of Physiology Paris.* 106(3-4):120-7.
8. Huang S, Treviño M, He K, Ardiles A, Di Pasquale R, Guo Y, Palacios A, Hugarir R and Kirkwood A. (2012) Pull-Push neuromodulation of LTP and LTD enables bidirectional experience-induced synaptic scaling in visual cortex. *Neuron.* 73(3):497-510.
9. Ardiles AO, Tapia-Rojas CC, Mandal M, Alexandre F, Kirkwood A, Inestrosa NC & Palacios AG. (2012) Post-synaptic dysfunction is associated with spatial and object recognition memory loss in a natural model of Alzheimer's disease. *Proceeding National Academy of Science.* 109 (34) 13835-13840.
10. Ardiles A, Ewer J, Acosta ML, Kirkwood A, Martinez A, Ebensperger LA, Bozinovic F, Lee T, Palacios AG. (2013). *Octodon degus* (Molina 1782): A model in comparative biology and biomedicine. *Cold Spring Harbor Protocols.* 4: 312-18.
11. PalaciosAG, Lee T, (2013). *Octodon degus* (Molina 1782): Husbandry and Breeding in the *Octodon degus*. *Cold Spring Harbor Protocols.* 4: 350-53.
12. Ocampo-GarcésA, Hernandez F, Palacios AG. (2013). REM sleep phase preference in the crepuscular *Octodon degus* assessed by selective REM sleep deprivation. *Sleep.* 36(8):1247-1256.
13. Vega-Zuniga T, Medina FS, Fredes F, Zuniga C, Severín D, Palacios AG, Karten HJ, Mpodozis J. (2013). Does nocturnality drive binocular vision? Octodontine rodents as a case study. *PLoS ONE* 8(12): e84199. doi:10.1371/journal.pone.0084199.

14. Escobar M.J., Palacios A.G. (2013). *Beyond the retina neural coding: On Models and Neural Rehabilitation*. J Physiol Paris. 107(5): 335-337.
15. Lowe J, Chang YL, Ardiles AO, Lim JC, Grey AC, Robertson KM, Danesh-Meyer HV, Palacios AG, Acosta ML. (2014). Alzheimer's disease in the human eye. Clinical tests that identify ocular and visual information processing deficit as biomarkers. *Alzheimer & Dementia*. Vol 10(2):251-261
16. Palacios-Muñoz A, Escobar MJ, Vielma A, Araya J, Astudillo A, Valdivia G, García IE, Hurtado J, Schmachtenberg O, Martínez AD, Palacios AG. (2014). Role of connexin channels in the retinal light response of a diurnal rodent. *Frontiers in Cellular Neuroscience* 8(249):1-13.
17. Ardiles, AO, Flores C, Ahumada J, Monyer H, Cárdenas, AM, Palacios AG, Muñoz-Carvajal P, Sáez JC, Fuenzalida M, Martínez AD. (2014). Pannexin 1 regulates the bidirectional hippocampal synaptic plasticity in the adult mice. *Frontiers in Cellular Neuroscience*. 8(236):1-11.
18. Alex H Vielma; Adolfo Agurto; Joaquín Valdés; Adrián G Palacios; Oliver Schmachtenberg. (2014). Nitric oxide modulates the temporal properties of the glutamate response in type 4 OFF bipolar cells. *PLoS One*, 9(12):e114330
19. Cárdenas JP, Olivares G, Cabrera F, Alfaro R, Goya D, Samaniego H, Gibert J, Palacios AG. (2014) Redes complejas: un caso de estudio sobre la colaboración científica. En *Las Rutas de la Complejidad*. Eds. Bustos, Marquez y Palacios. Pag. 177-210. Editorial Instituto de Sistemas Complejos de Valparaíso.
20. Inestrosa, N. C., Ríos, J. A., Cisternas, P., Tapia-Rojas, C., Rivera, D.S., Braidy, N., Zolezzi, J. M., Godoy, J. A., Carvajal, F. J., Ardiles, A. O., Bozinovic, F., Palacios, A. G. and Sachdev, P. S. (2015), Age Progression of Neuropathological Markers in the Brain of the Chilean Rodent *Octodon degus*, a Natural Model of Alzheimer's Disease. *Brain Pathology*. doi:10.1111/bpa.12226
21. Claudio Elgueta, Alex Harry Vielma, Adrian G Palacios and Oliver Schmachtenberg. (2015). Acetylcholine induces GABA release onto rod bipolar cells through heteromeric nicotinic receptors expressed in A17 amacrine cells. *Frontiers in Cellular Neuroscience* 9(6):1-11.
22. Du LY, Lily Y-L Chang, Alvaro O Ardiles, Cheril Tapia-Rojas, Joaquin Araya, Nibaldo C Inestrosa, Adrian G Palacios and Monica L Acosta. (2015). Alzheimer's disease-related protein expression in the retina of aged *Octodon degus*. In press *Plos One*. DOI: 10.1371/journal.pone.0135499
23. Hui Wang, Alvaro Ardiles, Sunggu Yang, Gonzalo Valdivia, Min Baek, Trinh Tran, Rafael Posada-Duque, Yang-An Chuang, Adrian G. Palacios, Michela Gallagher, Paul Worley, Alfredo Kirkwood. (2016). Metabotropic Glutamate Receptors Induce a Form of LTP Controlled by Translation and Arc Signaling in the hippocampus. *The Journal of Neuroscience*, 3 February 2016, 36(5):1723-1729; doi:10.1523/JNEUROSCI.0878-15.2016.
24. Claudia Salazar, Gonzalo Valdivia, Álvaro O Ardiles, John Ewer, Adrián G Palacios. (2016). Genetic variants associated with neurodegenerative Alzheimer disease in natural models. *Biol Res* (2016) 49:14 DOI 10.1186/s40659-016-0072-9.
25. Martínez G, Vidal RL, Mardones P, Serrano FG, Ardiles AO, Wirth C, Valdés P, Thielen P, Schneider BK, Kerr B, Valdés JL, Palacios AG, Inestrosa NC, Glimcher LH, Hetz C. (2016). Regulation of memory formation by the transcription factor XBP1. *Cell Reports*: 14(6):1382 - 1394

### Congress and Lectures

More than 125 abstract and talk presentation in congress meetings.

### Research Support (Ongoing)

1. 2016-2019 Trayectoria ANR - AAP 2015. Frederique Chavane PI, Guillaume Masson, Laurent Perrinet, Bruno Cessac, Maria Jose Escobar, Adrian Palacios Co-PI.
2. 2015-2019. The retina of *Octodon degus*: a natural model for validating molecular and physiological biomarkers for Alzheimer disease. FONDECYT #1150638 PI Adrian Palacios
3. 2015-2020. Role of endocannabinoid signaling in retinal synaptic function. FONDECYT #1151091 PI Andres Chavez, CO-PI Adrian Palacios.
4. 2014-2015 Mobile robotics to capture and study optical flow generated by octodon degus during locomotor activity in natural environment NICOP Research Grant -#N62909-14-1-N121. Office of Naval Research Global Investigador Principal: Adrián Palacios
5. 2014-2016. The role of non-standard retinal ganglion cells sensitive to motion features in motion integration tasks FONDECYT #1140403. Maria Jose Escobar PI. Adrian Palacios Co-Investigador.
6. 2014-2016. A Network for Computational Neuroscience: From Vision to Robotic ECOS / CONICYT C13E06. Investigador Responsable.
7. 2011-2016 Inst Científico Milenio "Centro Interdisciplinario de Neurociencia de Valparaíso" Co-PI. IC09-022-P.
8. 2011-2014 FONDECYT #1110292 Neurobiology of vision In the Retina of the diurnal rodent *Octodon degus*: A psychophysical, multi-Electrode and computational approach. PI.
9. 2011-2014 ANR (France)-CONICYT "Algorithms for modeling the visual system: From natural vision to numerical applications". PI, Chile.

### **Thesis supervision in my lab (present and past)**

- Postdoctoral Fellows (7)
- Postgraduate Students (12)
- Thesis Committees (17)
- Undergraduate (10)

### **Field of Research**

My lab search to understand How and Why a sensory system respond to the physics of the environment where animals inhabited. We work at different biological levels, from molecular events to animal behavior seen in their natural ecological conditions. With Francisco Varela and Timothy Goldsmith at Yale we have show that several animals, including birds, fishes, amphibian, lizard, uses ultraviolet light to shape their color vision space. To reconcile biology, philosophy and mathematics on the question how Perception is built, we have proposed in "Ways of coloring" (*Behavioral and Brain Sciences*, 15:1-74, 1992, along 33 commentaries) a theoretical and integrated comparative framework. Moving to the Universidad de Valparaiso I have continued to work in visual sensory ecology of animals from Chile, from single photoreceptor, electroretinogram (ERG) and habitat reflectance that are likely to be used as signals in sexual selection, recognition of conspecifics, camouflage. From retina slices and using patch-clamp we have study the biophysics of different bipolar, amacrine and ganglions cells types. More recently and moving to a neural network level, we have implemented a multi-electrode array (256 electrodes) recording technique to characterize the behavior of a large population (n=200-400) of ganglion cells and we are using mathematical tools to understand their neural coding mechanisms. In other hand, we work in the field of neurobiology of learning and memory, using behavior, biochemistry, and synaptic plasticity (LTP, LTD) to approach the etiology of neurodegeneration during aging in several rodent models including *Octodon degus*, a rodent that during aging develop the main hallmarks of Alzheimer diseases. Another area of my interest is complexity science and I coordinating several multidisciplinary activities at the *Instituto de Sistema de Complejos de Valparaiso, Chile* ([www.sistemascomplejos.cl](http://www.sistemascomplejos.cl)). For more details, see <http://cinv.uv.cl/apalacios>