

## Daniel Zaldivar, MD, PhD

Postdoctoral Research Scientist  
Curriculum Vitae

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Unit on Cognitive Neurophysiology and Imaging  
Laboratory of Neuropsychology,  
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## EDUCATION & TRAINING

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- 2018 – present      National Institute of Mental Health / National Institute of Health – Bethesda, MD, USA  
Postdoctoral Fellow in Cognitive Neurophysiology and Imaging  
Advisor - David Leopold, PhD  
Project: Functional mapping of basal forebrain projections in monkeys
- 2019 – 2018      International Max Planck Research School, University of Tübingen, Max Planck Institute for Biological Cybernetics - Tübingen, Germany  
PhD in Systems & Behavioral Neuroscience with Honors  
Advisor - Nikos Logothetis, PhD  
Dissertation: Effects of neuromodulation on neurovascular coupling
- 2001 – 2009      National Polytechnic Institute – School of Medicine, Mexico City  
MD with Honors  
Advisor - Jorge Sanchez, PhD  
Dissertation: Physiological and clinical aspects of mirror neurons
- 2003 – 2009      Centre for Research and Advanced Studies - Mexico City  
MD Research Training in Biophysics  
Advisor - Jorge Sanchez, PhD  
Project: Biophysics of excitable cells: Structure and function of voltage gated ion channels
- 2002      Centre for Research and Advanced Studies - Mexico City  
Research Assistant at Science Proteomics and Genomics Laboratory  
Advisor - Dr. Jesus Valdez Flores, PhD  
Project: pre-mRNA metabolism

## FUNDING

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- 2018 – 2021      Postdoctoral Fellowship from the German Research Foundation (DFG, Deutsche Forschungsgemeinschaft), ZA 990/1-1; 642452
- 2019      National Institute of Mental Health, IRP-OFT Trainee Travel Award
- 2017      Travel Grant Award from the Erice School Camillo Golgi, “from cell physiology to integrated signals and emerging brain function”, Erice, Italy.
- 2009 – 2016      Ph.D. Candidate Fellowship from the Max Planck Institute for Biological Cybernetics, Tübingen, Germany
- 2015      Travel Grant from the International Society for Magnetic Resonance in Medicine (ISMRM), Ontario, Toronto-Canada.

2012	Travel Award for the Training Course on Advance Statistical Modeling of Neuronal Data, Institute of Cognitive Science, Osnabrück-Germany.
2008 – 2009	Fellowship for Medicine Graduates, Secretary of Health (SSA), Mexico
2004 – 2007	Scholarship for Medical Students, National Council for Science and Technology (CONACyT), Mexico.

## HONORS & AWARDS

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2017	“Best Dissertation Award 2017” from the Förderverein für neurowissenschaftliche Forschung e.V., Tübingen, Germany
2017	“ <i>Magna Cum Laude</i> ”, International Max Planck Research School, Tübingen, Germany
2015	“ <i>Summa Cum Laude</i> ”, (Outstanding Scientific Work), International Society for Magnetic Resonance in Medicine (ISMRM),
2014	Leadership Award and Travel Grant from Novartis International Biotechnology Leadership Camp (BioCamp 2014), Basel-Switzerland.
2008	Medical Student Prize for Excellence, Pfizer Science Centre, Mexican Academy of Medicine, Mexican Association of Medical School and Faculties (AMFEM), National Council for Science and Technology (CONACyT). Mexico
2007	1 <sup>st</sup> . Place Award from the National Youth Contest of Science and Technology 2007. Mexican Academy of Science

## PUBLISHED ORIGINAL RESEARCH ARTICLES

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1. **Zaldivar D**, Logothetis NK & Goense J (*in prep.*): Laminar differences in neural activity during positive and negative BOLD conditions.
2. Lowe S, **Zaldivar D**, Murayama Y, Logothetis NK & Panzeri S (*in prep.*): Lamina and frequency distribution of information in primary visual cortex.
3. **Zaldivar D**<sup>‡</sup>, Rauch A, Logothetis NK & Goense J (2018): Two distinct profiles of fMRI and neurophysiological elicited by acetylcholine in visual cortex. *PNAS* 115: E12073-E12082 (<sup>‡</sup> *corresponding author*)
4. **Zaldivar D**<sup>‡</sup>, Goense J, Lowe S, Logothetis NK & Panzeri S<sup>‡</sup> (2018): Dopamine is signaled by mid-frequency oscillations and boosts output-layers visual information in visual cortex. *Current Biology* 28: 1-12. (<sup>‡</sup> *corresponding author*)
5. Damara-Fichtner N\*, Giapitzakis IA\*, Avdievich N, Mekle R, **Zaldivar D**, Henning A & Kreis R (2018): In vivo characterization of the downfield part of <sup>1</sup>H MR spectra of human brain at 9.4 T: Magnetization exchange with water and relation to conventionally determined metabolite content. *Magnetic Resonance in Medicine* 79(6): 2863-2879. (\* *co-first author*)
6. **Zaldivar D**<sup>‡</sup>, Rauch A, Whittingstall K, Logothetis NK & Goense J<sup>‡</sup> (2014): Dopamine-induced dissociation of BOLD and neural activity in macaque visual cortex. *Current Biology* 24: 2805–11. (<sup>‡</sup> *corresponding author*)

7. vonPfoestl V\*, Li J\*, **Zaldivar D**, Goense J, Zhang X, Serr N, Logothetis N & Rauch A (2012): Effects of lactate on early visual cortex of non-human primates investigated by pharmaco-MRI and neurochemical analysis. *Neuroimage* 61: 98–105.  
(\* co-first author)
8. Li J\*, vonPfoestl V\*, **Zaldivar D**, Zhang X, Logothetis N & Rauch A (2012): Measuring multiple neurochemicals and related metabolites in blood and brain of the rhesus monkeys by using dual microdialysis sampling and capillary hydrophilic interaction chromatography-mass spectrometry. *Analytical and Bioanalytical Chemistry* 402: 2545-54.  
(\* co-first author)
9. **Zaldivar D\***, González G\*, Carrillo E, Hernandez A, García MC & Sanchez JA (2010): Pharmacological preconditioning down-regulates cardiac L-type Ca<sup>2+</sup> channels. *British Journal of Pharmacology* 161: 1772–85.  
(\* co-first author)
10. **Zaldivar D**, García MC & Sanchez JA (2005): Ciliary neurotrophic factor promotes inactivation of muscle Ca<sup>2+</sup> channels via PKC. *Biochemistry Biophysics Research Communication* 338: 1572-7

## **PUBLISHED BOOK CHAPTERS, REVIEWS & COMMENTS**

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1. **Zaldivar D** (*in prep.*): Laminar Neurophysiology and Laminar fMRI. *Journal Neurophysiology*
2. **Zaldivar D**<sup>‡</sup>, Logothetis NK, Rauch A & Goense J<sup>‡</sup> (2017): Pharmaco-Based fMRI and Neurophysiology in Non-Human Primates. In: *In vivo Neuroparmacology and Neurophysiology*, (Ed) Athineous Philippou. Neuromethods of Springer Science Series  
(<sup>‡</sup> corresponding author)

## **PUBLISHED MEETING ABSTRACTS**

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### **2019**

- **Zaldivar D**, Koyano K & Leopold DA (2019). Local and global correlations of spontaneous electrophysiological activity measured from a single fMRI voxel. IRP Fellow Scientific Training Day, NIMH, NIH. Washington DC, USA. (**POSTER**)

### **2018**

- Murali-Manohar SV, Borbath T, Fichtner N, Giapitzakis IA, **Zaldivar D**, Kreis R, & Henning A (2018). Estimation of T2 Relaxation Times of Downfield Peaks in Human Brain at 9.4 T. (**POSTER**)

### **2017**

- **Zaldivar D**, Rauch A, Logothetis N & Goense J (2017). Effects of cholinergic neuromodulation on fMRI and neural responses in macaque visual cortex. Neuromodulation of Neural Microcircuits (NM2). Blue Brain Conference, Lausanne, Geneva, Switzerland. (**POSTER**)
- Paßlack U, Lara E, Logothetis N & **Zaldivar D** (2017). In vivo real time-coupled electrical and electrophysiological signals detection using MR compatible multi-modal probes in rodents (NM2). Blue Brain Conference, Lausanne, Geneva, Switzerland. (**POSTER**)
- Damara-Fichtner N, Giapitzakis IA, Avdievich N, Mekle R, **Zaldivar D**, Henning A & Kreis R (2017). Modelling of the downfield spectrum for exchange rates and T1 values in human brain at 9.4T. ISMRM, Honolulu, Hawaii, USA. (**POSTER**)

- Damara-Fichtner N, Giapitzakis IA, Avdievich N, Mekle R, **Zaldivar D**, Henning A & Kreis R (2017). Measuring exchange between brain metabolites and water using ultra-high field magnetic Resonance Spectroscopy. GCB Symposium. Universitat Bern, Switzerland. *(TALK)*

#### 2016

- **Zaldivar D**, Goense J, Lowe S, Logothetis NK & Panzeri S (2016). Dopamine elicits lamina- and frequency specific increase of information in the local field potentials of macaque V1. SfN's 46<sup>th</sup> Annual Meeting. San Diego California, USA. *(POSTER)*

#### 2015

- **Zaldivar D**, Logothetis NK & Goense J (2015). Laminar differences in neural activity during positive and negative BOLD conditions. Annual Meeting ISMRM, Toronto, Ontario, Canada. *(TALK)*

#### 2014

- Lowe S, **Zaldivar D**, Murayama Y, Logothetis NK & Panzeri S (2014). Different cortical layers in V1 encode different visual information in different frequency bands. SfN's 44<sup>th</sup> Annual Meeting. Washington DC, USA. *(POSTER)*
- Lowe S, **Zaldivar D**, Murayama Y, Logothetis NK & Panzeri S (2014). Quantification of the laminar and frequency structure of information in primary visual cortex. 9<sup>th</sup> FENS, Forum of Neuroscience. Milan-Italy. *(POSTER)*

#### 2012

- **Zaldivar D**, Li J, vonPfoestl V, Whittingstall K, Rauch A & Logothetis NK (2012). The modulatory role of dopamine in the early visual system of macaques investigated by fMRI, neurochemistry and neurophysiology. 8<sup>th</sup> FENS, Forum of Neuroscience. Barcelona-Spain. *(POSTER)*
- vonPfoestl V, **Zaldivar D**, Li J, Viswanath S, Zhang X, Logothetis NK & Rauch A (2012). Electrophysiological effects of lactate on primary visual cortex on non-human primates. Veronika vonPfoestl, 8<sup>th</sup> FENS, Forum of Neuroscience. Barcelona-Spain. *(POSTER)*

#### 2011

- Li J\*, **Zaldivar D**\*, vonPfoestl V, Zhang X, Logothetis NK & Rauch A (2011). Targeted tissue sampling and imaging in non-human primates brain with microdialysis and fMRI. European Foundation for Clinical Nanomedicine, Basel, Switzerland. *(POSTER)*
- **Zaldivar D**, Li J, vonPfoestl V, Zhang X, Logothetis NK & Rauch A (2011). Dopaminergic modulation of the early visual system of non-human primates and its underlying neuronal and hemodynamic changes. SfN's 41<sup>th</sup> Annual Meeting, Washington DC, USA. *(POSTER)*
- Li J\*, **Zaldivar D**\*, vonPfoestl V, Serr N, Zhang X, Logothetis NK & Rauch A (2011). Nicotinic modulation of early visual system and its underlying neuronal and metabolic changes. SfN's 41<sup>th</sup> Annual Meeting, Washington DC, USA. *(POSTER)*

#### 2010

- Li J\*, vonPfoestl V\*, **Zaldivar D**, Zhang X, Logothetis NK & Rauch A (2010). Comparing concentration levels of multiple neurochemically active compounds in the blood and brain tissue of non-human primates by using dual microdialysis sampling and capillary hydrophilic interaction chromatography mass spectrometry. SfN's 40<sup>th</sup> Annual Meeting, San Diego California, USA. *(POSTER)*
- vonPfoestl V, Li J, **Zaldivar D**, Zhang X, Logothetis NK & Rauch A (2010). Effects of lactate in primary visual cortex of non-human primates investigated by pharmaco-MRI and neurochemical analysis. SfN's 40<sup>th</sup> Annual Meeting, San Diego California, USA. *(POSTER)*

- Gonzalez G\*, **Zaldivar D\***, Carrillo E, Garcia MC & Sanchez JA (2010). The cardiac  $\alpha_{1C}$  subunit is downregulated by pharmacological preconditioning. 54<sup>th</sup> Annual Meeting Biophysical Society, San Francisco California, USA. (*POSTER*)

#### 2008

- **Zaldivar D**, González G, Carrillo E, García MC & Sánchez JA (2008). Down regulation of the L-type  $Ca^{2+}$  channel by pharmacological preconditioning in mammalian heart. 52<sup>nd</sup> Annual Meeting of the Biophysical Society, Long Beach California, USA. (*POSTER*)
- **Zaldivar D**, González G, Carrillo E, García MC & Sánchez JA (2008). Down regulation of the L-type  $Ca^{2+}$  channel by pharmacological preconditioning in mammalian heart. LI National Congress of Physiological Sciences by Mexican Society of Physiological Sciences. (*TALK*)

#### 2007

- González G, Carrillo E, **Zaldivar D**, Hernández A, García MC & Sánchez JA (2007). Increased interaction between PKC and the rat L-Type Calcium Channel in an ischemic preconditioning model. International Congress Medichem-FeNaSTAC 2007, Mexico City, Mexico. (*POSTER*)
- Carrillo E, Escobar Y, **Zaldivar D** & Sánchez JA (2007). Differential expression of beta<sub>2</sub>  $Ca^{2+}$  channels subunit isoforms in adults and rat heart cells. 51<sup>st</sup> Annual Meeting of the Biophysical Society, Batimore Maryland USA. (*POSTER*)

#### 2006

- Carrillo E, Escobar Y, **Zaldivar D** & Sánchez JA (2006). Expression of different isoforms of  $\beta^2$  subunit of L type  $Ca^{2+}$  channels in cardiac muscle cells in neonatal and adult rats. XXVI Meeting of the Mexican Society of Biochemistry, Guanajuato, Mexico. (*POSTER*)
- **Zaldivar D**, García MC & Sánchez JA (2006). Modulation of L-type  $Ca^{2+}$  channels of adult mouse skeletal muscle by the ciliary neurotrophic factor. 50<sup>th</sup> Annual Meeting of the Biophysical Society, Salt Lake City Utah, USA. (*POSTER*)

### INVITED PRESENTATIONS & SEMINARS

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#### 2017

- 02 December 2017, School of Brain Cells and Circuits “Camillo Golgi”, Ettore Majorana Foundation and Centre for Scientific Culture, Erice, Italy, “SnapShot on Neuromodulation and neurovascular coupling.”
- 30 November 2017, School of Brain Cells and Circuits “Camillo Golgi”, Ettore Majorana Foundation and Centre for Scientific Culture, Erice, Italy, “Effects of Neuromodulation on neurovascular coupling.”

#### 2015

- 20 November 2015, National Institute of Health, Bethesda, MD, USA, “Effects of neuromodulation on neurovascular coupling.”
- 30 June 2015, Universitäre Psychiatrische Dienste Bern, Switzerland, “Dopamine-induced dissociations of BOLD and neural activity.”
- 3 June 2015, McGovern Institute for Brain Research: Massachusetts Institute of Technology, Cambridge, MA, USA, “The effects of neuromodulation on the neurovascular coupling.”
- 13 January 2015, Instituto de Neurobiología, UNAM, Querétaro, México, “Neural mechanisms underlying fMRI signals and the role of neuromodulation at shaping neurovascular-coupling relationship.”

#### 2014

- 13 August 2014, Donders Institute, Nijmegen, Netherlands, “Mid-frequency oscillations in visual cortex of monkeys are sensitive to neuromodulation.”

**2012**

- 15 February 2012, Leibniz Institute for Neurobiology, Magdeburg, Germany, “Dopaminergic neuromodulation of early visual system of macaques investigated by fMRI, neurophysiology and neurochemistry.”

**2011**

- 9 September 2011, Conference *Networks*, University of Tuebingen, “Pharmacological approach for neuromodulation.”

**2010**

- 9 August 2010, National Polytechnic Institute, Mexico City, “Cracking the neural code for sensory perception: the self-modulation of neural circuits.”

**2006**

- 27 June 2006, National Polytechnic Institute, Mexico City, “Ion channels and cancer.”
- 19 January 2006, National Polytechnic Institute, Mexico City, “Biochemistry and biophysics of ion channels.”

**PROFESSIONAL ACTIVITIES**

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2018 – 2019	Max Planck Institute for Biological Cybernetics, Tübingen, Germany <i>Guest Scientist</i>
2015 – 2017	Regierungspräsidium Tübingen <i>Responsible for the animal ethics from Two Projects in Monkeys:</i> KY 4/09 and KY 4/16 Max Planck Institute for Biological Cybernetics, Tübingen, Germany
2011 – 2014	Regierungspräsidium Tübingen <i>Responsible for the animal ethics from a Projects in Rodents:</i> KY 7/14 Max Planck Institute for Biological Cybernetics, Tübingen, Germany
2007 – 2009	General Hospital, Carlos MacGregor, Mexico City <i>Medical Intern</i>
2003 – 2009	Centre for Research and Advanced Studies, Mexico City <i>Research Assistant</i>

**INSTITUTIONAL SERVICE**

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2019	NIH Post-bac Poster Day volunteer judge
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**MENTORING**

*(trainees from whom I serve(d) as primary or co-primary mentor)*

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2015 – 2017	Ulrike Paßlack (Master Student) Co-mentored in cooperation with the University of Ulm, Germany Project: A Multimodal Probe for the Simultaneous Multi-Site Electrophysiology and Electrochemistry in the Rodent Brain.  <i>Currently: PhD student at Institut für Nano- und Mikroelektronische Systeme (INES), Universität Stuttgart, Germany</i>
2011 – 2012	Sneha Vismanath/Eberhardt (Master Student) Co-mentored in cooperation with the University of Tuebingen, Germany project: Role of Adenosine in Neurovascular Coupling  <i>Currently: MBA candidate at the Imperial College Business School, London, UK.</i>

## **PROFESSIONAL AFFILIATIONS**

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- Member, Society of Neuroscience, FENS (2010 – 2016)
- Member, Federation of European Neuroscience, FENS (2012 – present)
- Member, German Society of Neuroscience (2012 – present)
- Member, Neuroinformatics (2012 – 2016)

## **AD HOC JOURNAL REVIEW**

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- Current Biology
- Journal of Chemical Neuroanatomy
- Scientific Reports (Nature Publishing Group)
- Neuroimage
- Journal Psychopharmacology (SAGE)
- International Journal Neuropsychopharmacology (Oxford University Press)
- European Neuropsychopharmacology
- Neuropsychopharmacology
- Human Brain Mapping

## **SKILLS/OTHER**

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Spanish (native), English (proficient), German, Italian (basic)