**BOS Rémi, PhD**

(Oct. 11 1986, 2 children --08/03/20 & 20/10/22--)

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**PROFESSIONAL EXPERIENCE**

01/10/2018 – present: **Institut de Neurosciences de la Timone, CNRS** (Marseille, France)

Scientific researcher (Tenure position at CNRS, Institute of Biological Sciences (INSB), Section 25th, Molecular and Cellular Neurobiology, Neurophysiology)

01/09/2016 – 30/09/2018: **Institut de Neurosciences de la Timone, CNRS** (Marseille, France)

Post-doctoral fellow in Neuroscience

Advisor: Frédéric Brocard

01/01/2013 – 31/08/2016: **Department of Molecular and Cell Biology & Helen Wills Neuroscience Institute**, (University of California, Berkeley, USA)

Post-doctoral fellow in Neuroscience

Advisor and Mentor: Marla Feller

**EDUCATION & TRAINING**

01/02/2024 : **Habilitation à Diriger des Recherches (HDR)** (Aix-Marseille Univ., France)

01/10/2018 : **Chargé de Recherche Classe Normale (CRCN)** (Tenure position at CNRS, Section 25th CNRS, Molecular and Cellular Neurobiology, Neurophysiology)

01/09/2009 – 21/12/2012: **PhD degree** in Neuroscience

Institut de Neurosciences de la Timone, CNRS (Marseille, France)

Supervisor : Laurent Vinay

01/09/2008 – 30/06/ 2009: **Master degree** in Molecular and Cellular Neurosciences

Aix-Marseille Univ.(Marseille, France)

Supervisors : Laurent Vinay & Sophie Morel

01/09/2007 – 30/06/2009: **Magistère** in Sport Sciences

Department of Sport Sciences, Ecole Normale Supérieure **(**Rennes, France)

Supervisor : Jacques Prioux

01/09/2004 – 30/06/2007: **B.S degree** in Sport Sciences

Department of Sport Sciences, Rennes Univ.,(Rennes, France)

Supervisor : Jacques Prioux

**GRANTS & AWARDS**

2024: Research Partner from ANR PRC Rhythmoglia (PI: Jean-Marie Mangin) (280 K€)

2023: Research Partner from INT grant award (to F. Debarbieux) (CNRS UMR7289) (40K€)

2022: INT grant award “Fonds d’investissement” (CNRS UMR7289) (20K€)

2021: Research Partner from ANR JCJC BRAINSTORM (PI: David Moreau) (30K€)

2021: Co-supervisor of CIFRE PhD grant (3years) to V. Escarrat (co-supervision with Pr. F. Debarbieux) in collaboration with the Regenlife company (120K€)

2021: Supervisor of PhD grant (French ministry for research, 3years) to Tony Barbay (120K€)

2019: INT grant award “Fonds d’investissement” (CNRS UMR7289) (30K€)

2017: PRESTIGE-MARIE CURIE grant award (40K€, PCOFUND-GA-2013-609102)

2013: Travel grant for Cold Spring Harbor Laboratory Vision Course (CSH, USA) (2K$)

2013: Honor prize for the best thesis 2012 (Aix-Marseille University) (1K€)

2011: Travel grant for SfN meeting in Washington DC, USA (1K€)

2009-2012: PhD fellowship (French ministry for research) (90K€)

2007-2009: Undergraduate fellowship (ENS Cachan-Antenne de Bretagne) (60K€)

**PUBLICATIONS**

* Escarrat V, Reato D., Blivet G., Touchon J., Rougon G., **Bos R.**\* and Debarbieux F.\* Dorsoventral photobiomodulation therapy safely reduces inflammation and reduces sensorimotor deficits in a mouse model of multiple sclerosis. ***J. Neuroinflammation***, 2024 doi: 10.1186/s12974-024-03294-2, \*equally contributed
* Barbay T., Pecchi E., Ramirez-Franco J., Ivanov A., Brocard F., Rouach N., **Bos R**. Functional contribution of astrocytic Kir4.1 channels to spasticity after spinal cord injury. ***bioRxiv***, 2024, doi: 10.1101/2024.10.11.617793
* Dumas N., Pecchi E., O’Connor R., **Bos R**., Moreau D. Infrared neuroglial modulation of spinal locomotor networks. ***Sci. Rep.,*** 2024 doi: 10.1038/s41598-024-73577-4
* Harris-Warrick R.,Pecchi E., Drouillas B.,Brocard F, **Bos R.** Effect of size on expression of bistability in mouse spinal cord. ***J. Neurophysiol.***, 2024 doi: 10.1101/2023.09.29.559784
* Drouillas B.,Brocard C., Zanella S., **Bos R.**, Brocard F. Persistent Nav1.1 and Nav1.6 currents drive spinal locomotor functions through nonlinear dynamics. ***Cell Rep.***, 2023 doi: 10.1101/2023.04.18.537411
* Barbay T., Pecchi E., Ducrocq M., Rouach N., Brocard F., **Bos R.** Astrocytic Kir4.1 channels regulate locomotion by orchestrating neuronal rhythmicity in the spinal network. ***Glia***,2023 doi: 10.1002/glia.24337
* **Bos R.**, Rihan K., Quintana P., El-Bazzal L., Bernard-Marissal N., Bartoli M., Jabbour R., Mégarbane A., Brocard F., Delague V. Smaller action potential and shorter axonal initial segment in hiPSC-derived motor neurons with mutations in *VRK1* ***Neurobiol. Dis.***, 2022 doi: 10.1016/j.nbd.2021.105609.
* **Bos R.**, Drouillas B., Bouhadfane M., Pecchi E., Korogod S., Brocard F. Trpm5 channels encode bistability of spinal motoneurons and ensure motor control of hindlimbs. ***Nat. Comm.*** 2021 doi: 10.1038/s41467-021-27113-x.
* **Bos R**., Harris-WarrickR.M., BrocardC., DemianenkoL.E., ManuelM., ZytnickiD., KorogodS.M., Brocard F. Kv1.2 channels promote nonlinear spiking motoneurons for powering up locomotion.***Cell Rep.*** 2018 doi: 10.1016/j.celrep.2018.02.093.
* **Bos R**., Gainer C., Feller M.B. Role for visual experience in the development of direction selective circuits. ***Curr. Biol***, 2016 doi: 10.1016/j.cub.2016.03.073.
* Rosa J.M.\*, **Bos R**.\*, Sack G.S., Fortuny C., Agarwal A., Bergles D.E., Flannery J.G., Feller M.B. Neuron-glia signaling in developing retina mediated by neurotransmitter spillover. ***Elife***, 2015

**\*these authors contributed equally to this work** doi: 10.7554/eLife.09590.

* Vlasits A.L., **Bos R.**, Morrie R.D., Fortuny C., Flannery J.G., Feller M.B., Rivlin-Etzion M. Visual stimulation switches the polarity of excitatory input to starburst amacrine cells. ***Neuron***, 2014 doi: 10.1016/j.neuron.2014.07.037.
* **Bos R**., Sadlaoud K., Buttigieg D., Liabeuf S., Boulenguez P., Brocard C., Haase G., Bras H., Vinay L. Activation of 5-HT2A receptors up-regulates the function of the neuronal K-Cl cotransporter KCC2. ***Proc Natl Acad Sci USA,*** 2013 doi: 10.1073/pnas.1213680110.
* **Bos R**., Vinay L. Glucose is an adequate energy substrate for the depolarizing action of GABA and glycine in the neonatal rat spinal cord in vitro. ***J. Neurophysiol*.** 2012 doi: 10.1152/jn.00571.2011.
* **Bos R**., Brocard F., Vinay L. Primary afferent terminals acting as excitatory interneurons contribute to spontaneous motor activities in the immature spinal cord ***J. Neurosci.*** 2011 doi: 10.1523/JNEUROSCI.0068-11.2011.
* Viemari JC, **Bos R**, Boulenguez P, Brocard C, Brocard F, Bras H, Coulon P, Liabeuf S, Pearlstein E, Sadlaoud K, Stil A, Tazerart S, Vinay L. Chapter 1-importance of chloride homeostasis in the operation of rhythmic motor networks. ***Progr. Brain. Res*.** 2011 doi: 10.1016/B978-0-444-53825-3.00006-1.
* Boulenguez P, Liabeuf S, **Bos R**, Bras H, Jean-Xavier C, Brocard C, Stil A, Darbon P, Cattaert D, Delpire E, Marsala M, Vinay L. Down-regulation of the potassium-chloride cotransporter KCC2 contributes to spasticity after spinal cord injury. ***Nat Med*.** 2010 doi: 10.1038/nm.2107.

**INVITED & CONTRIBUTED TALKS (5 PAST YEARS)**

* “Astrocyte-targeting therapy for reducing spasticity after spinal cord injury in mice” at Institute of Neurophysiopathology, Marseille, FRANCE, Dec. 2023. Invited by E. Nivet
* “The embodied CNS: Neuron-glia crosstalk in spinal rhythmicity” at the 5th edition of the international conference of the Institute of Neurosciences of La Timone, Marseille, FRANCE, Sept. 2022 Invited by G. Masson
* “A size principle for bistability in mouse lumbar motoneurons” at the International Motoneuron Society meeting, Banff, CANADA, June 2022. Invited by M. Gorassini
* “Astrocytic modulation of neuronal rhythmicity through K+ uptake” at NeuroFrance 2021, the International virtual symposium organised by the French Neuroscience Society (webinar), May 2021. Invited by M. Thobby-Brisson
* “Plasticity of the spinal motor networks: a focus on the neuron-glial interaction” at IBDM (Luminy Campus, Marseille, France), PhD Program Tutored Seminar, Oct. 2020. Invited by F. Mann
* “The astrocyte-Motoneuron crosstalk in the spinal motor network after spinal cord injury” at CERIMED, Scientific morning of Carnot STAR, March 2020. Invited by G. Gallon

**EVALUATION COMMITTEE MEMBER (5 PAST YEARS)**

* Examining committee member for the “Christine Goudot Prize”, Fondation de France, Sept. 2024
* Reviewing member of the thesis advisory committee (CST) Gabrielle Dosilie (PhD candidate, INT, supervised by Eduardo Gascon), July 12, 2024
* Examining committee member for Agathe Lafont’s thesis defense (Sorbonne University) December 15, 2023. PhD supervisor: Jean-Marie Mangin
* Reviewing member of the thesis advisory committee (CST) of Nathan Dumas (PhD candidate, Ecole des Mines de Gardanne, supervised by David Moreau), June 30, 2023

**ORGANISATIONS OF CONFERENCES & MEETINGS (5 PAST YEARS)**

* Co-Organizer of the Workshop: Mechanisms of CNS Transient Dynamics, March 14-15, 2024
* Organizing Committee Member of the INT Meeting (10th Anniversary), Sept. 28-30, 2022
* Organizing Committee Member of the European Glia Meeting (EUROGLIA 2021), July 7-10, 2021
* Organizer of « Journée Portes Ouvertes de l’INT CNRS UMR7289 », Nov.-Dec. 2017-2018-2019

**TEACHING, SUPERVISING & MENTORING (5 PAST YEARS)**

* Thibault Belloin, Undergraduate student in MSc Degree, “The nonneuronal component of pain. Specific focus on the role of the astrocytic lactate metabolism in neuronal excitability from spinal dorsal horn.” Jan. 2024-June 2024 (Mention B, Obtained a PhD fellowship from the French ministry for research).
* Darine Gadacha, Undergraduate student in MSc Degree, “The protein machinery of the astrocytic lactate metabolism in the spinal dorsal horn.” April 2024-June 2024 (Mention B, Obtained a PhD fellowship from the French ministry for research).
* Brahmia Chainese, Undergraduate student in BSc Degree, “The protein machinery of the astrocytic lactate metabolism in the spinal dorsal horn.” May 2023
* Maxime Racchini, Undergraduate student in BSc Degree, “Characterization of morphological astrocyte reactivity in spinal cord injuried tissue” February 2023
* Vincent Escarrat, PhD candidate co-supervised by Franck Debarbieux and myself (INT, CNRS UMR7289) working on “Evaluation par microscopie intravitale de l’intérêt de la photobiomodulation sur les poussées inflammatoires d’un modèle murin de Sclérose en Plaques” funded by ANRT. He has started his PhD from April. 1st 2021 to present
* Tony Barbay, PhD candidate working on the “Contribution of the neuro-glia crosstalk in the plasticity of the spinal motor network” funded by a 3 years fellowship from the French ministry for research. He has started his PhD from Oct. 1st 2021 to present
* Myriam Ducrocq, Undergraduate student in Master 2 Degree, “Contribution of the astoglial Kir4.1 and Na/K ATPase pump to the spinal locomotor network excitability” January, 2019–May, 2019 (Mention AB)

**ACTIVITIES GENERAL INTEREST & SCIENCE DIFFUSION**

* Co-founder and active member of the “Gender equity & Diversity Committee” at INT, CNRS UMR7289, 2023
* Member of the “Ethic committee” CE71 at INT, CNRS UMR7289, from June 2018 to Oct. 2020
* Member of the Local Organizing Committee for EUROGLIA2021 (July 2021, Virtual event), and for the 10th anniversary of INT, “A decades’perspective on integrative neuroscience” (Sept. 28-30, 2022, Marseille).
* Scientific contributor of “La Nuit européene des chercheurs” (2017, 2018)
* High school internship supervisor once a year (Léo Massot, Maya Ayrault, Anaïs Cabiran, Iban Caprise, Malika Azakir, Noémie Moreau).

**ADHOC REVIEWS**

Journal of Neurophysiology (2012), eLife (2016), Psychopharmacology (2020), Frontiers in Cell and Developmental Biology (2022), Frontiers in Neural Circuits (2023), European Journal of Neuroscience (2023), Frontiers in Physiology (2024), Glia (2024).

**SKILLS & LANGUAGES**

**Languages**: English (fluent), French (native), Spanish (basic)

**Programming language:** Matlab (basic), Python (basic)

**Experimental techniques:** *in vitro* electrophysiology(Patch-clamp recordings of hIPSCs), *ex vivo* electrophysiology(intracellular recordings of astrocytes, neurons (retina & spinal cord) & extracellular recordings of retina & spinal cord), *in vivo* electrophysiology (EMG recordings of gastrocnemius, FSL), two-photon calcium imaging of astrocytic and neuronal signaling, *in vivo* injections of AAVs or retrograde tracers, *in vivo* drug micro-injection, *ex vivo* DREADDS & optogenetics, behavioral motor and vision tests, perfusion, immunohistochemistry, live tracking and analysis of motor behavior with DeepLabCut.

**ACTIVE SCIENTIFIC COLLABORATIONS**

* **Dr. David Moreau** (Ecole des Mines de Saint-Etienne, Centre Microelectronique, Gardanne, France), bioelectronic of infra-red illumination for studying neuro-glia interaction.
* **Dr. Lucile Ben Haïm** (UMR9199, CNRS/CEA, Université Paris-Saclay, Fontenay-aux-Roses, France), electrophysiological recordings of neuron-glia interaction in the hippocampal network
* **Dr. Carole Escartin** (UMR9199, CNRS/CEA, Université Paris-Saclay, Fontenay-aux-Roses, France), electrophysiological recordings of reactive astrocytes diversity in the prefrontal cortex
* **Pr. Nathalie Rouach** (Collège de France, Paris, France), neurobiology of astroglia with transgenic mice.
* **Dr. Franck Debarbieux** (CNRS UMR7289, Aix-Marseille University, France), intravital microscopy of glial cells in neuroinflammation.