**BOS Rémi, PhD**

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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: Marla Feller

**EDUCATION & TRAINING**

01/09/2009 – 31/12/2012: **Institut de Neurosciences de la Timone, CNRS** (Marseille, France) PhD degree in Neuroscience

Supervisor : Laurent Vinay

01/09/2008 – 30/06/ 2009: **Department of Neurosci.,** **Aix-Marseille Univ.** (Marseille, France)

Master degree in Molecular and Cellular Neurosciences

Supervisor : Laurent Vinay & Sophie Morel

01/09/2007 – 30/06/2009: **Department of Sport Sciences, Ecole Normale Supérieure, (**Rennes, France)

Magistère in Sport Sciences

Supervisor : Jacques Prioux

01/09/2004 – 30/06/2007: **Department of Sport Sciences, Rennes Univ.,** (Rennes, France)

B.S degree in Sport Sciences

Supervisor : Jacques Prioux

**GRANTS & AWARDS**

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

2021: Research Partner from ANR JCJC BRAINSTORM (PI: David Moreau) (20K€)

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€)

2018-2020: Nominated member of the Animal Research Ethics Committee Board #71

2017: PRESTIGE-MARIE CURIE grant award (30K€, 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**

**1-** 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

**2-** 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

**3- 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.

**4- 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.

**5- 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.

**6- 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.

**7-** 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.

**8-** 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.

**9- 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.

**10- 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.

**11- 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.

**12-** 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.

**13-** 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.

**INTERNATIONAL CONFERENCE ABSTRACTS (only first-author/last-author posters are listed)**

1- Barbay T., Pecchi E. and **Bos R**. “Astrocytic contribution in spasticity after spinal cord injury” Abstract ID #471, Poster number #T11-055B at EUROGLIA, July 2023, Berlin, Germany

1- Pecchi E., Ducrocq M. and **Bos R**. “Astrocytic modulation of neuronal rhythmicity through K+ uptake in the spinal locomotor network” Abstract ID #889, Poster number #T09-087E at EUROGLIA 2021 July 2021

2- **Bos R**., Harris-WarrickR.M., BrocardC., DemianenkoL.E., KorogodS.M., Brocard F. “Kv1.2 channels promote nonlinear spiking motoneurons for powering up locomotion.” *Poster at* SfN meeting, Washington DC, USA Nov. 2017

3- **Bos R**., Gainer C., Feller M.B. “Role for visual experience in the development of direction selective circuits.” Poster at SfN meeting, Chicago, USA, Oct. 2015

4- **Bos R**.\*, Rosa J.M.\*, Sack G.S., Fortuny C., Flannery J.G., Feller M.B. “Neuron-glia signaling in developing retina mediated by neurotransmitter spillover.” Poster at FASEB Retinal Neurobiology and Visual Processing conference, June 2014

5- **Bos R**. “Development of directional selectivity in the retinal network.” Poster at the Cold Spring Harbor Laboratory Vision course, CSH, USA June 2013

6- **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.” Poster at the FENS meeting, Barcelona, SPAIN, July 2012

7- **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.” Poster at the SfN meeting, Washington DC, USA, Nov. 2011

8- **Bos R**., Brocard F., Vinay L. “Primary afferent terminals acting as excitatory interneurons contribute to spontaneous motor activities in the immature spinal cord.” Poster at the French Neuroscience Society congress, Marseille, FRANCE, May 2011

**INVITED & CONTRIBUTED TALKS**

1- “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

2- “A size principle for bistability in mouse lumbar motoneurons” at the International Motoneuron Society meeting, Banff, CANADA, June 2022

3- “Astrocytic modulation of neuronal rhythmicity through K+ uptake” at NeuroFrance 2021, the International virtual symposium organised by the French Neuroscience Society (webinar), May 2021

4- “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

4- “The astrocyte-Motoneuron crosstalk in the spinal motor network after spinal cord injury” at CERIMED, Scientific morning of Carnot STAR, March 2020

5- “The development and function of direction selective circuits in the retina” Ecole Normale Superieur de Rennes, FRANCE, May 2016

6- “The development and function of direction selective circuits in the retina” at UC Santa Cruz, California, USA, May 2015

7- “The mechanisms underlying spontaneous activity in the immature spinal cord” at the Life Sciences Doctoral School ED62, Aix-Marseille University, June 2011

**EVALUATION COMMITTEE MEMBER**

Rapporteur member of the Thesis Monitoring committee (CST) of Nathan Dumas (PhD student, Ecole des Mines de Gardanne), June 30, 2023

**ORGANISATIONS OF CONFERENCES & MEETINGS**

1- Organizing Committee Member of the INT Meeting (10th Anniversary), Sept. 28-30, 2022

2- Organizing Committee Member of the European Glia Meeting (EUROGLIA 2021), July 7-10, 2021

3- Organizer of « Journée Portes Ouvertes de l’INT CNRS UMR7289 », Nov.-Dec. 2017-2018-2019

4- Volunteer for the 3rd INT neuroscience conference, Marseille, FRANCE, Sept. 15-17, 2016

5- Volunteer for the French Neuroscience Society congress, Marseille, FRANCE, May 24-27, 2011

**TEACHING, SUPERVISING & MENTORING**

1- Maxime Racchini, Undergraduate student in BSc Degree, “Characterization of morphological astrocyte reactivity in spinal cord injuried tissue” February 2023

2- 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

3- Tony Barbay, PhD candidate co-supervised by Frédéric Brocard and myself (INT, CNRS UMR7289) working on the “Contribution of the neuro-glia crosstalk in the plasticity of the spinal motor network” funded by MRT. He has started his PhD from Oct. 1st 2021 to present

4- Tony Barbay, Undergraduate student in Master 2 Degree, “Contribution of the astoglial Kir4.1 to the spinal locomotor network excitability” January, 2021–June, 2021 (Mention TB, Obtained the PhD fellowship of the French ministry for research).

5- 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)

6- Benoit Drouillas, Undergraduate student in Master 1 Degree, “Study of the development of the firing properties of spinal motoneurons by using electrophysiological patch-clamp recordings” October, 2016–June, 2017 and March, 2018–June, 2018 (Mention B)

7- Omar Al Jammal and Amber Burkey, Undergraduate students, “Development of a behavioral test to determine the role of retinal direction-selective cells in driving visually-guided behaviors.” September, 2015–March, 2016

8- Joseph Aman, Rotation student,“Two-photon calcium imaging of direction-selective ganglion cells in the mouse retina” August 2015– November, 2015

9- Kaili Zhou, Rotation student, “Development of the direction-selective circuits in the mouse retina. A quantitative approach.” January 2015–July 01, 2015

10- Andy Jan, Undergraduate student, “Neurolucida reconstruction of direction-selective cells in the retina” UC Berkeley September 2013– April, 2014

11- Stephanie Guyot-Forrest, Undergrad. student, “Quantification of the mosaic distribution of direction-selective ganglion cells in the retina.” Summer internship UC Berkeley June 2013 – August 2013

**ACTIVITIES GENERAL INTEREST & SCIENCE DIFFUSION**

1. Co-founder of the “Gender equity & Diversity Committee” at INT, CNRS UMR7289, 2023
2. Member of the “Ethic committee” CE71 at INT, CNRS UMR7289, from June 2018 to Oct. 2020
3. 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).
4. Scientific contributor of “La Nuit européene des chercheurs” (2017, 2018)
5. 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).

**SKILLS & LANGUAGES**

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

**Programming language:** Matlab (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.

**ACTIVE SCIENTIFIC COLLABORATIONS**

1- **Pr. Ron Harris-Warick** (Department of Neurobiology and Behavior, Cornell University, USA), neurobiology of the spinal locomotor networks.

2- **Pr. Serge Korogod** (Oles Honchar Dnipro University, Ukraine), computational neuroscience of the spinal locomotor networks.

3- **Dr. Valérie Delague** (INSERM U1251, Aix-Marseille University, France), genetic of the hereditary diseases affecting the sensory-motor inputs.

4- **Dr. David Moreau** (Ecole des Mines de Saint-Etienne, Centre Microelectronique, Gardanne, France), bioelectronic of infra-red illumination for studying neuro-glia interaction.

5- **Pr. Nathalie Rouach** (Collège de France, Paris, France), neurobiology of astroglia with transgenic mice.

6- **Dr. Isabelle Leray** (Ecole Normale Supérieure Paris-Saclay University, France), chemistry of K+ probe

7- **Pr. Franck Debarbieux** (CNRS UMR7289, Aix-Marseille University, France), intravital microscopy of neuroinflammation.

**CONTACTS**

1- **Dr** **Guillaume Masson** (Group Head, Director of Institut de Neurosciences de la Timone)

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2- **Pr. Abdel El Manira** (Group Head)

Department of Neuroscience Karolinska Institutet Retzius väg 8 S-17177 Stockholm, SWEDEN

Phone: (+46) (0) 8-524 869 11

Email: Abdel.Elmanira@ki.se

3- **Pr. Marla B. Feller** (Group Head)

Professor, Department of Molecular and Cell Biology & Helen Wills Neuroscience Institute

University of California, Berkeley, USA

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