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Neuroglial Interactions in Cerebral Physiopathology
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❖ Current activity (2019 - present)

Post-doctoral researcher at Collège de France in the Neuroglial Interactions in Cerebral Physiopathology laboratory, Paris, France
Director: Dr. Nathalie Rouach
Topic: Analysis of neuroglial interactions in social behavior
Keywords: mouse behavior, social interactions, astrocyte, calcium imaging, miniscope, oxytocin, cocaine

❖ Postdoctoral training

2014-2018: Post-doctoral researcher at Institute of Physiopathology/Medical University of Mainz, Germany
Director: Pr. Albrecht Stroh
Topic: Analysis and recovery of neuronal microcircuit activity in Huntington's disease
Keywords: mouse behavior, visual cortex, Huntington's disease, calcium imaging, optogenetics, microcircuits, two-photon microscope, *in vivo* electrophysiology

❖ Doctoral training

Ph.D. thesis at laboratory of Neurophysiology and New Microscopies, INSERM U603, CNRS 8154, Paris Descartes University (dir. Dr. Serge Charpak)
Supervisor: Dr. Etienne Audinat
Topic: Microglia roles in the development of mice somatosensory neocortex.
Jury: *President: Claire Legay. Reporters: Alain Bessis, Pascal Legendre. Examiners: Lauriane Ulmann.*
Date of Ph.D. defence: 24/04/2014
Keywords: Neurodevelopment, somatosensory cortex, microglia, thalamocortical synapse, fractalkine, CX3CR1, Kv1.3 potassium channel, electrophysiology

❖ Education

2010: Master degree in Cellular Biology, Physiology and Pathology from Paris Descartes University, Paris, France
2008: Bachelor degree in Life sciences from Paris Descartes University, Paris, France

❖ Internships

2009-2010: Master training in the laboratory of Neurophysiology and New Microscopies INSERM U603, CNRS UMR 8154, Paris Descartes University, Biomedical UFR, France (dir. Dr. Serge Charpak)
Topic: Implication of microglial cells in the postnatal development of primary somatosensory cortex in mice.
Supervisor: Dr. Etienne Audinat
2009: Master training in the laboratory of Transcriptional Regulation and Genetic Diseases CNRS UPR 2228, Paris Descartes University, Biomedical UFR, France (dir. Dr. Philippe Djian)
Topic: Influence of the Wnt/beta-catenin signaling pathway on the myelination of the central and peripheral nervous systems in mice.

Supervisor: Dr. Julien Grenier

2008: Summer training in the laboratory of Brain Physiology CNRS 8118, Paris Descartes University, Biomedical UFR, France (dir. Dr. Alain Marty)

Topic: Patch-clamp exploration on cerebellum slices.

Supervisor: Dr. Céline Auger

❖ **Research publications** (7 articles, 5 as first author)

1. Navigating the translational roadblock: toward highly specific and effective all-optical interrogations of neural circuits

Fu T*, **Arnoux I***, Döring J*, Backhaus H, Watari H, Stasevicius I, Stroh A

iScience 2021

2. Metformin reverses early cortical network dysfunction and behavior changes in Huntington's disease

Arnoux I*, Willam M.*, Griesche N.*, Krummeich J., Watari H., Offermann N., Weber S., Narayan Dey P., Chen C., Monteiro O., Buettner S., Meyer K., Bano D., Radyushkin K., Langston R., Lambert J.J., Wanker E., Methner A.*, Krauss S.*, Schweiger S.*, Stroh A.**

eLife 2018

3. Maladaptive cortical hyperactivity upon recovery from experimental autoimmune encephalomyelitis
Ellwardt E. *, Pramanik G. *, Luchtman D., Novkovic T., Rosales Jubal E., Vogt J., **Arnoux I.**, Vogelaar C., Mandal S., Schmalz M., Barger Z., de Azua I., Kuhlmann T., Lutz B., Mittmann T., Bittner S., Zipp F. *, Stroh A. *

Nature Neuroscience 2018; 21, pages 1392–1403

4. Paradoxical effects of minocycline in the developing mouse somatosensory cortex.

Arnoux I., Hoshiko M, Sanz-Diez A, Audinat E.

Glia. 2014 Mar; 62(3):399-410.

5. Potent and multiple regulatory actions of microglial glucocorticoid receptors during CNS inflammation.

Carrillo-de Sauvage MÁ, Maatouk L, **Arnoux I**, Pasco M, Sanz Diez A, Delahaye M, Herrero M T, Newman T A, Calvo C F, Audinat E, Tronche F, Vyas S.

Cell Death Differentiation. 2013 Nov; 20(11):1546-57.

6. Adaptive phenotype of microglial cells during the normal postnatal development of the somatosensory "barrel" cortex.

Arnoux I*, Hoshiko M*, Mandavy L, Avignone E, Yamamoto N, Audinat E.

Glia 2013 Oct; 61(10): 1582-94.

7. Deficiency of the microglial receptor CX3CR1 impairs postnatal functional development of thalamocortical synapses in the barrel cortex.

Hoshiko M*, **Arnoux I***, Avignone E, Yamamoto N, Audinat E.

J Neurosci. 2012 Oct;32(43):15106-11.

❖ **Reviews** (3 in total)

1. Microglia in CNS development: Shaping the brain for the future.

Mosser CA*, Baptista S*, **Arnoux I***, Audinat E.

Prog Neurobiol. 2017 Feb - Mar

2. Fractalkine signaling and microglia functions in the developing brain

Arnoux I and Audinat E.

Neural Plasticity 2015.

3. Microglia: immune cells sculpting and controlling neuronal synapses. (in French)

Audinat E, **Arnoux I.**

Med Sci (Paris). 2014 Feb;30(2):153-9.

❖ **Book chapters** (2 in total)

1. Electrophysiological investigation of microglia

In book: Microglia

Avignone E, Milior G, **Arnoux I**, Audinat E

Methods Mol Biol. 2019

2. Concepts of All-Optical Physiology

In book: Optogenetics: a roadmap

Doering J, Fu T, **Arnoux I**, Stroh A.

Neuromethod 2018

❖ **Conferences**

- 2022: meeting of Federation of European neuroscience societies (poster, Paris, France)
- 2021: meeting of the French club of glial cells (poster, virtual)
- 2019 : Minerva School 2019 (chairman, Regensburg, Germany)
- 2017: meeting of Society for Neuroscience (poster, Washington, USA)
- 2016: meeting of Federation of European neuroscience societies (poster, Copenhagen, Denmark)
- 2015: meeting of Focus Program Translational Neurosciences (talk, Mainz, Germany)
- 2013: meeting of the French society of neuroscience (talk, Lyon, France)
- 2012: meeting of the Federation of European neuroscience societies (poster, Barcelona, Spain)
- 2012: meeting "Speak about microglia" (talk, ENS, Paris, France)
- 2011: meeting of the French society of neuroscience (poster, Marseille, France)
- 2010: meeting of the French club of glial cells (poster, Paris, France)

❖ **Teaching**

2021 Lecturer at the Neuroscience BIP Master (UE: Neurodegenerative disorders & Myelin pathologies, Dec 7th, Paris, France)

2018 Lecturer at the Spring School of Neurology (April 25th, Mainz, Germany)

Teaching Assistant during the workshop "A practical roadmap to optogenetics" (June 3rd-6th, Mainz, Germany)

2016 Lecturer at the Autumn School of Neurology (Nov 18th, Mainz, Germany)

2015 Teaching Assistant during the ELSC International School "Intracellular in-vivo recordings" (Aug 30th - Sept 10th, Eilat, Israel)

2014 Teaching Assistant during the workshop "A practical roadmap to optogenetics" (Oct 20th-24th, Mainz, Germany)

❖ **Student training** (15 students)

June – August 2022: Supervision of Matthieu Cieutat, 2nd year student from the engineer school AgroParisTech (France)

May-June 2022: Supervision of Margot Courret, 3rd year bachelor student from Animal physiology and neuroscience bachelor of Montpellier university (France)

August 2017: Supervision of Ranya Al Shekaki, Cristina Eich and Johanna Hoffmann, master students from the Biomedical master of Mainz University (Germany)

October 2016: Supervision of Nadine Kreutzenberger, Julia Meier, Leonie Schmidt and Anne Buehrke, master students from the Biomedical master of Mainz University (Germany)

January - June 2014: Supervision of Coralie-Anne Mosser, master student from the Neuroscience master of Paris Sud University (France)

June/July 2012 Supervision of a Julie Aires, 1st year BTS student from ENCPB (France)

January - June 2014: Supervision of Alvaro Sanz Diez, master student from the Neuroscience master of Paris Descartes University (France)

April 2011 Supervision of Lucile Vignaud, 1st year bachelor student of Pierre and Marie Curie University (France)

January - June 2011: Supervision of Léo Mandavy, master student from the Neuroscience master of Paris Descartes University (France)

November 2010 - January 2011 Supervision of Julie Cendre, 2nd year BTS student from ENCPB (France)

❖ **Certifications**

2020: CNU (French National University Council), Qualification for lecturer profession, section 69 (Neurosciences)

2019: Certificate of fundamental theoretical bases in surgery on laboratory animal (Animaform, France)

2018: Certificate with distinction of online course Writing in science from Stanford University

2014: Certificate of course on Laboratory Animal Science- FELASA category B (Provadis, Germany)

❖ **Fellowships**

2016: IBRO Travel Grant for FENS

2014-2016: Post-doctoral stipend from Focus Group Translational Neuroscience

2013-2014: Fellowship “fin de thèse” from Fondation pour la Recherche Médicale

2010-2013 : PhD Fellowship from Ministère de la recherche et de l'éducation supérieure of France

❖ **Administrative responsibilities**

2021 – present: Representative of Ph.D. students and post-doc of the Center for Interdisciplinary Research in Biology, Paris, France

2021 – present: Member of the GreenCom CIRB, Paris, France

2018 – present: Member of the Neuroscience Graduates' Colloquium (NGC), Mainz, Germany

2018 Co-organisation of a three-days workshop: A practical roadmap to optogenetics, Mainz, Germany

❖ **Non-academic scientific activities**

Blogs articles

- Link to my collaborative blog (40 articles): <https://www.ngc-mainz.de/blog>
- Two articles on the science innovation union blog:
 - Brain gut axis: microglia under focus
<https://science-union.org/articlelist/2019/4/14/brain-gut-axis-microglia-under-focus>
 - How to treat neurological disease by optogenetics
<https://science-union.org/articlelist/2018/4/17/how-to-treat-neurological-diseases-by-optogenetics>
- One article on the Association Bernard Gregory website:
<https://www.abg.asso.fr/fr/article/1990/fr-s-expatrier-en-allemande-pour-son-post-doc-1990>

Study group

Enrolled in studies of the Babylab of Ecole Normale Supérieure (Paris, France) – Laboratory of Cognitives sciences and Psycholinguistics

❖ **Skills**

Electrophysiology, 2P calcium imaging, endoscopic calcium imaging, optogenetics, optic fibers, immunohistochemistry, virus injection, uncaging, confocal microscopy, immunofluorescence, genotyping, mouse behavioral tests