



# Stéphane Lolignier, PhD, HDR



**Associate Professor** (Maître de Conférences Universitaire):

- Clermont Auvergne University, School of Medicine, Medical Pharmacology
- NEURODOL lab (UMR 1107 INSERM/UCA)  
Team Fundamental and Clinical Pharmacology of Pain

**Member of the Institut Universitaire de France** (junior innovation chair 2024-2029)

Born April 26<sup>th</sup>, 1983

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## University Degrees

- 2022 **Accreditation to Supervise Research** (Habilitation à Diriger des Recherches)  
Clermont Auvergne University  
Manuscript title: *Development of TREK1 activators with an analgesic purpose*
- 2011 **Ph.D. in Neurosciences**  
UMR 766 INSERM/University of Auvergne, Clermont-Ferrand, France  
Co-Directors: Pr Alain Eschalier and Dr Jérôme Busserolles  
Thesis title: *Role of the Nav1.9 sodium channel in inflammatory pain, noxious cold perception and oxaliplatin-induced cold hypersensitivity*
- 2007 **M.Sc. in Genetics and Physiology**, specialization in Neurosciences  
Blaise Pascal University, Clermont-Ferrand, France
- 2005 **B.Sc. in Animal Physiology**  
Blaise Pascal University, Clermont-Ferrand, France

## Research experience

- Sep 2015 – present **Associate Professor**  
Clermont Auvergne University, School of Medicine, Medical Pharmacology  
NEURODOL Lab, UMR 1107 INSERM  
National University Council section 69: Neurosciences  
*Improvement of the benefit/risk ratio of analgesic drugs*
- Mar 2012 – Aug 2015 **Postdoctoral fellow**  
University College London, Wolfson Institute for Biomedical Research, Molecular  
Nociception Group  
Director: Pr John N Wood  
*Molecular basis of mechanonociception*
- Sep 2007 – Dec 2011 **Ph.D. student**  
University of Auvergne, UMR 766 INSERM/UdA  
Co-directors: Pr Alain Eschalier and Dr Jérôme Busserolles

## Teaching experience

From 2015 to 2024, I was doing each year around 200 hours of courses and practical work to Bachelor's and Master's students at Clermont Auvergne University (Biology and Medicine schools, and at the University Institute of Technology). I am responsible for the Neuropsychopharmacology teaching unit open to Master's students in Biology and Medicine and co-responsible for the Tutored Projects teaching unit for 3<sup>rd</sup> year Biology students, as well as module 2 of the STEPHADOL Pain Capacity (pain training module intended for physicians and caregivers). During my PhD, I gave 96 hours of teaching per year at the University Institute of Technology. As a member of the Institut Universitaire de France, my teaching service will be reduced to 64 hours per year from 2024 to 2029.

## Awards and Grants

- 2024 Junior Innovation Chair awarded by the *Institut Universitaire de France*  
*Development of safer pain therapeutics using venom toxins*
- 2022 Young Investigator Grant awarded by the French Research Agency (ANR Jeune chercheur, 352 k€), principal investigator  
*Bypassing Opioid Receptors for Safer Analgesia: direct activation of downstream TREK1 channels (BORSA)*
- 2021 Innovation Grant (chèque recherche innovation) awarded by the Hub Innovergne (7 k€), principal investigator  
*Identification of conotoxins of interest for the treatment of chronic pain (CONIDOL)*
- 2020 Collaborative Grant awarded by the Analgesia Institute (23 k€), principal investigator  
*Discovery of new K2P channels ligands by high throughput screening*
- 2020 I-SITE CAP20-25 Collaborative Grant (120 k€ for a shared post-doctoral fellow), partner scientific manager (PI: Vincent Mirouse, iGReD, Université Clermont Auvergne)  
*Study of the functional interaction between the Dystrophin-associated protein complex (DAPC) and the Ork1 potassium channel*
- 2020 I-SITE CAP20-25 Emergence Grant (27 k€ for the project, 10 k€ for NEURODOL), partner scientific manager (PI: Vincent Mirouse, iGReD, Université Clermont Auvergne)  
*Study of the role of the Dystrophin complex in establishing an electrochemical gradient and the planar polarity of the actin cytoskeleton*
- 2019 FEDER Grant awarded by the Auvergne Rhône Alpes region (913 k€ for 2 academic and 2 industrial partners, 245 k€ for NEURODOL), coordinator  
*Identification and characterization of TREK1 activators with an analgesic purpose (OPTIM'DOL)*
- 2018 I-SITE CAP20-25 Collaborative Grant (70 k€ for the project, 45 k€ for NEURODOL), partner scientific manager (PI: Clément Michelin, Clermont-Ferrand Institute of Chemistry)  
*Identification and characterization of TREK1 activators with an analgesic purpose*
- 2018 I-SITE CAP20-25 Research Grant (40 k€), principal investigator  
*Role of adhesion GPCRs in sensory mechanotransduction (ADHESION)*
- 2015 Research Grant awarded by the Fyssen Foundation (32 k€), principal investigator  
*Dissociating morphine's analgesic and adverse effects: the promise of the TREK1 channel*
- 2010 PhD Scholarship (1 year) awarded by the French League Against Cancer
- 2007 PhD Scholarship (3 years) awarded by the French Ministry of Research
- 2006 M.Sc. scholarship awarded by Blaise Pascal University

## Students and staff

2023-2026	Romane Bony, PhD student
2023	Romane Bony, M.Sc. year 2
2022	Romane Bony, M.Sc. year 1
2021-2024	Romane Boyer, PhD student
2021-2023	Julien Schopp, assistant engineer (funded by the Domiconus company)
2021	Romane Boyer, M.Sc. year 2
2021	Léa Aubert, B.Sc. year 3, work/study program
2019-2021	Julien Schopp, technician (funded by the Innopain company)
2019-2021	Maxence Maugis, assistant engineer (FEDER OPTIM'DOL project)
2019	Maxence Maugis, B.Sc. year 3, work/study program
2019	Maxime Teixeira, B.Sc. year 3
2019	François Vuillemin, B.Sc. year 3
2019	Louison Nallet, B.Sc. year 2
2018-2019	Julien Schopp, B.Sc. year 3, work/study program
2018	Julien Schopp, B.Sc. year 2
2016	Julia Bruyère, B.Sc. year 2
2015	Anna Biller, M.Sc.
2013	Mathilde Gras, B.Sc. year 2
2013	Clara Ponsolles, M.Sc. year 1
2013	Sophie Williams, Wellcome Trust PhD student, first year rotation
2009	François Coustillères, M.Sc. year 2
2009	Benjamin Mathieu, M.Sc. year 1
2008	Nicolas Kerckhove, M.Sc. year 1

## Publications

1. Delanne-Cuménal M, Lamoine S, Meleine M, Aissouni Y, Prival L, Fereyrolles M, Barbier J, Cercy C, Boudieu L, Schopp J, Lazdunski M, Eschalier A, Lolignier S, Busserolles J. *The TREK-1 potassium channel is involved in both the analgesic and anti-proliferative effects of riluzole in bone cancer pain.* **Biomedicine & pharmacotherapy** 2024 Jul;176:116887
2. Meynier M, Daugey V, Mallaret G, Gervason S, Meleine M, Barbier J, Aissouni Y, Lolignier S, Bonnet M, Ardid D, De Vos WM, Van Hul M, Suenart P, Brochot A, Cani PD, Carvalho FA. *Pasteurized *akkermansia muciniphila* improves irritable bowel syndrome-like symptoms and related behavioral disorders in mice.* **Gut Microbes** 2024 Jan-Dec;16(1):2298026.
3. Gervason S, Meleine M, Lolignier S, Meynier M, Daugey V, Birer A, Aissouni Y, Berthon JY, Ardid D, Filaire E, Carvalho FA. *Antihyperalgesic properties of gut microbiota: *Parabacteroides distasonis* as a new probiotic strategy to alleviate chronic abdominal pain.* **Pain** 2023 Sep 27.
4. Pereira V, Lamoine S, Cuménal M, Lolignier S, Aissouni Y, Pizzoccaro A, Prival L, Balayssac D, Eschalier A, Bourinet E, Busserolles J. *Epigenetics Involvement in Oxaliplatin-Induced Potassium Channel Transcriptional Downregulation and Hypersensitivity.* **Molecular Neurobiology** 2021 Jul;58(7):3575-3587.
5. Gkika D\*, Lolignier S\*, Grolez GP, Bavencoffe A, Shapovalov G, Gordienko D, Kondratskyi A, Meleine M, Prival L, Chapuy E, Etienne M, Eschalier A, Shuba Y, Skryma R, Busserolles J, Prevarskaya N. *Testosterone-androgen receptor: The steroid link inhibiting TRPM8-mediated cold sensitivity.* **The FASEB Journal** 2020 Jun;34(6):7483-7499 \*Joint first authors.

6. Busserolles J, Ben Soussia I, Pouchol L, Marie N, Meleine M, Devilliers M, Judon C, Schopp J, Clémenceau L, Poupon L, Chapuy E, Richard S, Noble F, Lesage F, Ducki S, Eschalier A, Lolignier S. *TREK-1 channel activation as a new analgesic strategy devoid of opioid adverse effects*. **British Journal of Pharmacology** 2020 Oct;177(20):4782-4795.
7. Busserolles J, Lolignier S, Kerckhove N, Bertin C, Authier N, Eschalier A. *Replacement of current opioid drugs focusing on MOR-related strategies*. **Pharmacology & Therapeutics** 2020 Mar 9:107519.
8. Potchoo Y, Goeh-Akue E, Damorou F, Lolignier S, Massoka B, Redah D, Guissou IP. *Antihypertensive drug regimen for high blood pressure associated with modifiable cardiovascular risk factors among hypertensive patients attending campus teaching hospital of Lomé, Togo, West Africa*. **Journal of Pharmaceutical and Pharmacological Sciences** 2018 JPPS-176.
9. Poupon L, Lamoine S, Pereira V, Barriere DA, Lolignier S, Giraudet F, Aissouni Y, Meleine M, Prival L, Richard D, Kerckhove N, Authier N, Balayssac D, Eschalier A, Lazdunski M, Busserolles J. *Targeting the TREK-1 potassium channel via riluzole to eliminate the neuropathic and depressive-like effects of oxaliplatin*. **Neuropharmacology** 2018 Sep 15;140:43-61.
10. Kanellopoulos AH, Koenig J, Huang H, Pyrski M, Millet Q, Lolignier S, Morohashi T, Gossage SJ, Jay M, Linley JE, Baskozos G, Kessler BM, Cox JJ, Dolphin AC, Zufall F, Wood JN, Zhao J. *Mapping protein interactions of sodium channel Nav1.7 using epitope-tagged gene-targeted mice*. **The EMBO Journal** 2018 Feb 1;37(3):427-445.
11. Raouf R\*, Lolignier S\*, Sexton JE, Millet Q, Santana-Varela S, Biller A, Fuller AM, Pereira V, Choudhary JS, Collins MO, Moss SE, Lewis R, Tordo J, Henckaerts E, Linden M, Wood JN. *Inhibition of somatosensory mechanotransduction by annexin A6*. **Science Signaling** 2018 Jun 19;11(535) \*Joint first authors.
12. Vivier D, Soussia IB, Rodrigues N, Lolignier S, Devilliers M, Chatelain FC, Prival L, Chapuy E, Bourdier G, Bennis K, Lesage F, Eschalier A, Busserolles J, Ducki S. *Development of the first Two-Pore Domain Potassium Channel TREK-1 (TWIK-Related K(+) Channel 1)-selective agonist possessing in vivo anti-nociceptive activity*. **Journal of Medicinal Chemistry** 2017 Feb 9;60(3):1076-1088.
13. Lolignier S, Gkika D, Andersson D, Leipold E, Vetter I, Viana F, Noël J, Busserolles J. *New Insight in Cold Pain: Role of Ion Channels, Modulation, and Clinical Perspectives*. **Journal of Neuroscience** 2016 36, 11435–11439.
14. Koenig J, Werdehausen R, Linley JE, Habib AM, Vernon J, Lolignier S, Eijkelkamp N, Zhao J, Okorokov AL, Woods GC, Wood JN, Cox JJ. *Regulation of Nav1.7: a Conserved SCN9A Natural Antisense Transcript Expressed in Dorsal Root Ganglia*. **PLoS One** 2015 Jun 2;10(6):e0128830.
15. Minett MS, Pereira V, Sikandar S, Matsuyama A, Lolignier S, Kanellopoulos AH, Mancini F, Iannetti GD, Bogdanov YD, Santana-Varela S, Millet Q, Baskozos G, MacAllister R, Cox JJ, Zhao J, Wood JN. *Endogenous opioids contribute to insensitivity to pain in humans and mice lacking sodium channel Nav1.7*. **Nature Communications** 2015 Dec 4;6:8967.
16. Lolignier S, Bonnet C, Gaudioso C, Noël J, Ruel J, Amsalem M, Ferrier J, Rodat-Despoix L, Bouvier V, Aissouni Y, Prival Y, Chapuy E, Padilla F, Eschalier A, Delmas P, Busserolles J. *The Nav1.9 channel is a key determinant of cold pain sensation and cold allodynia*. **Cell Reports** 2015 May 19;11(7):1067-78.
17. Lolignier S, Eijkelkamp N, Wood JN. *Mechanical allodynia*. **Pflügers Archives - European Journal of Physiology**. 2015 Jan;467(1):133-9.
18. Paterson K\*, Lolignier S\*, Wood JN, McMahon SB, Bennett DL. *Botulinum toxin-A treatment reduces human mechanical pain sensitivity and mechanotransduction*. **Annals of Neurology** 2014 Apr;75(4):591-6. \*Joint first authors.
19. Devilliers M, Busserolles J, Lolignier S, Deval E, Pereira V, Alloui A, Christin M, Mazet B, Delmas P, Noel J, Lazdunski M, Eschalier A. *Activation of TREK-1 by morphine results in analgesia without adverse side-effects*. **Nature Communications** 2013;4:2941.

20. Lolignier S, Amsalem M, Maingret F, Padilla F, Gabriac M, Chapuy E, Eschalier A, Delmas P, Busserolles J. *Nav1.9 Channel Contributes to Mechanical and Heat Pain Hypersensitivity Induced by Subacute and Chronic Inflammation*. **PLoS One** 2011;6(8):e23083.
21. Chassain C, Bielicki G, Durand E, Lolignier S, Essafi F, Traoré A, Durif F. *Metabolic changes detected by proton magnetic resonance spectroscopy in vivo and in vitro in a murin model of Parkinson's disease, the MPTP intoxicated mouse*. **Journal of Neurochemistry** 2008 May;105(3):874-82.