RITCHY HODEBOURG, Ph.D.

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EDUCATION

Ph.D., Neuropharmacology 2014-2019
Université de Montréal Montreal, QC
Graduated with Honors

Master's, Physiology Pharmacology and Neurosciences 2011-2013
Université de Poitiers Poitiers, France
Graduated with Honors

Bachelor's, Cell Biology and Physiology 2007-2010
Université de Bordeaux Bordeaux, France

HONORS / AWARDS

- Travel award, Neurobiology of Stress conference 2024
- Special award from the Lowcountry Center for Veterans Research at the 2023 Perry V. Halushka MUSC Research Day 2023
- 1st Place Winner at the 2023 Perry V. Halushka MUSC Research Day 2023
- ACNP URM Near-Peer Mentorship Program laureate 2023
- Award of the Summer 2022 MUSC Trainee Global Health Travel Grants 2022
- Award of the French Caribbean Talent: prize rewarding the excellence of the educational background 2019
- Travel award, Cold Spring Harbor Labs Neuroscience of Addiction Course 2019
- Merit scholarship of Collectivité Territoriale de la Martinique 2017
- Best Poster: *Journée de la recherche Gabriel L. Plaa*, Department of Pharmacology and Physiology at *Université de Montréal* 2016
- Doctoral scholarship of Collectivité Territoriale de la Martinique 2014-2016

PUBLICATIONS

Hodebourg R, Duncan L, Dereschewitz E, Kalivas PW. Cannabinoid use generalizes stress responses: involvement of astrocyte plasticity and activation of matrix metalloproteinases in the nucleus accumbens core. Mol Psychiatry, 2026

Hodebourg R, Scofield M, Kalivas PW, Kuhn BN. Nonneuronal contributions to synaptic function. *Neuron*. doi:10.1016/j.neuron.2025.04.004.

Hodebourg, R. (2025). In Vivo Zymography: An Essential Activity Assay for Studying the Activity of Matrix Metalloproteinases in Specific Brain Cells. *Methods Mol Biol, 2918*, 21-33. doi:10.1007/978-1-0716-4482-9_3.

Lewandowski, SI, **Hodebourg, R**, Wood, SK, et al. Matrix metalloproteinase activity during methamphetamine cued relapse. Addiction Biology. 2023; 28 (5):e13279. doi:10.1111/adb.13279.

Hodebourg R, Meyerink ME, Crow AD, Reichel CM, Kalivas PW, Garcia-Keller C. Cannabinoid use is enhanced by stress and changes conditioned stress responses. Neuropsychopharmacology. 2022 Apr;47(5):1037-1045. doi: 10.1038/s41386-022-01287-4. Epub 2022 Feb 10. PMID: 35145212; PMCID: PMC8938410.

Hodebourg R, Kalivas PW, Kruyer A. Extrasynaptic therapeutic targets in substance use and stress disorders. Trends Pharmacol Sci. 2022 Jan;43(1):56-68. doi: 10.1016/j.tips.2021.10.006. Epub 2021 Nov 6. PMID: 34753604; PMCID: PMC8688303.

Garcia-Keller C, Carter JS, Kruyer A, Kearns AM, Hopkins JL, **Hodebourg R**, Kalivas PW, Reichel CM. Behavioral and accumbens synaptic plasticity induced by cues associated with restraint stress. Neuropsychopharmacology. 2021 Sep;46(10):1848-1856. doi: 10.1038/s41386-021-01074-7. Epub 2021 Jul 5. PMID: 34226657; PMCID: PMC8357931.

Hodebourg R. (2021) Intracranial Self-Stimulation: Using the Curve-Shift Paradigm to Assess the Abuse Potential of Drugs. In: Fakhoury M. (eds) The Brain Reward System. Neuromethods, vol 165. Humana, New York, NY. https://doi.org/10.1007/978-1-0716-1146-3_10.

Chioma V.C., Kruyer A., Bobadilla A.-C., Angelis A., Ellison Z., **Hodebourg R**., Scofield M.D. & Kalivas P.W., Heroin Seeking and Extinction from Seeking Activate Matrix Metalloproteinases at Synapses on Distinct Subpopulations of Accumbens Cells, Biological Psychiatry (2021), doi: https://doi.org/10.1016/j.biopsych.2020.12.004.

Hodebourg R, Murray JE, Fouyssac M, Puaud M, Everitt BJ, Belin D. Heroin seeking becomes dependent on dorsal striatal dopaminergic mechanisms and can be decreased by N-acetylcysteine. Eur J Neurosci. 2019 Aug;50(3):2036-2044. doi: 10.1111/ejn.13894. Epub 2018 Mar 30. PMID: 29514413; PMCID: PMC6767855.

Complete list of publications:
https://www.ncbi.nlm.nih.gov/myncbi/ritchy.hodebourg.1/bibliography/public/

IN PREPARATION:

Walterhouse SJ, Dereschewitz E, Hopkins JL, **Hodebourg R**, Chung D, Garcia-Keller C, Kalivas PW, Kuhn BN. Alteration of nucleus accumbens dendritic spine morphology following protracted abstinence in heroin vulnerable rats. *In preparation for 2025.*

PRESENTATIONS

Hodebourg, R.*, Kalivas, P. (2024). Stress and cannabis use change stress responses by altering Perineuronal nets in the ventral pallidum. 63rd Annual Meeting of American College of Neuropsychopharmacology. Phoenix, Arizona, United States.

Hodebourg, R.*, Kalivas, P. (2024). Stress and cannabis use change stress responses by altering Perineuronal nets in the ventral pallidum. 53rd Annual Meeting of the Society for Neuroscience. Chicago, IL, United States.

Hodebourg, R.*, Duncan, L., Testen, A., Kalivas, P. (2023). Cannabis use changes conditioned stress responses by altering the morphological plasticity of astrocytes and the activity of matrix metalloproteinases in the nucleus accumbens core. 62nd Annual Meeting of American College of Neuropsychopharmacology. Tampa, FL, United States.

Hodebourg, R.*, Duncan, L., Testen, A., Kalivas, P. (2023). Cannabis use changes conditioned stress responses by altering the tetrapartite synaptic plasticity in the nucleus accumbens core. 52nd Annual Meeting of the Society for Neuroscience. Washington, DC, United States.

Hodebourg, R.*, Duncan, L., Testen, A., Kalivas, P. (2023). Cannabis use changes conditioned stress responses by altering the tetrapartite synaptic plasticity in the nucleus accumbens core. Medical University of South Carolina Research Day. Charleston, SC, United States.

Hodebourg, R.*, Duncan, L., Kalivas, P. (2023). The role of perineuronal nets in the Ventral Pallidum on coping strategies. Medical University of South Carolina Research Day. Charleston, SC, United States.

Hodebourg, R.*, Testen A., M., Kalivas, P. (2023). Cannabis use changes conditioned stress responses by altering the tetrapartite synaptic plasticity in the nucleus accumbens core. Gordon research conference: Cannabinoid Function in the CNS. Barcelona, Spain.

Hodebourg, R.*, Garcia-Keller, C., Kalivas, P.(2022). The role of matrix metalloproteinases 2 and 9 in the nucleus accumbens after an exposure to an acute stress and a stress-conditioned cue. 61st Annual Meeting of American College of Neuropsychopharmacology.

Hodebourg, R.*, Garcia-Keller, C., Kalivas, P.(2022). Effect of acute stress and stress-conditioned cues on matrix metalloproteinases in the nucleus accumbens core. 51th Annual Meeting of the Society for Neuroscience. San Diego, CA, United States.

Hodebourg, R.*, Meyerink, M., Crow,A., Reichel, C., Kalivas, P., Garcia-Keller, C (2021). Cannabis use exacerbates conditioned stress responses. Gordon research conference: Cannabinoid Function in the CNS. Ventura, CA, United States.

Hodebourg, R.*, Garcia-Keller, C., Reichel, C., Kalivas, P.(2020). Acute stress exacerbates cannabis use and cannabis use exacerbates the capacity of a stress-conditioned stimulus to induce stress responses. Annual Meeting of Specialized Centers of Research Excellence.

Hodebourg, R.*, Garcia-Keller, C., Kalivas, P.(2020). Effect of acute stress and stress-conditioned cues on matrix metalloproteinases in the nucleus accumbens core. 59th Annual Meeting of American College of Neuropsychopharmacology.

Hodebourg, R.* and Rompré, P.P. (2018). Effect of N-acetylcysteine on the expression of cocaine-induced locomotor sensitization and cocaine-enhanced brain stimulation rewards in rats. Program No 417. 48th Annual Meeting of the Society for Neuroscience. San Diego, CA, United States.

Hodebourg, R.* and Rompré, P.P. (2018). N-acetylcysteine decreases the expression of cocaine-induced locomotor sensitization. NeuroSymposium 2018. Montréal, QC, Canada.

Hodebourg, R.* and Rompré, P.P. (2017). Effect of N-acetylcysteine on cocaine-enhanced brain stimulation rewards in rats. NeuroSymposium 2017. Montréal, QC, Canada.

Hodebourg, R.* and Samaha, A.-N. (2016). N-acetylcysteine decreases the motivation to self-administer cocaine in rats. Program No 636.18. 46th Annual Meeting of the Society for Neuroscience. San Diego, CA, United States.

Hodebourg, R.* and Samaha, A.-N. (2016). The Influence of chronic N-acetylcysteine treatment on the motivation to take cocaine. NeuroSymposium 2016. Montréal, QC, Canada.

SEMINARS

Florida State University, USA: *Cannabis use changes stress responses by altering the multipartite synaptic* (2026)

University of Florida, USA: *Cannabis use changes stress responses by altering the multipartite synaptic* (2026)

University at Albany, USA: *Cannabis use changes stress responses by altering the multipartite synaptic* (2025)

Rutgers Addiction Research Center, USA: *Cannabis use changes stress responses by altering the multipartite synaptic* (2025)

University at Buffalo, USA: *Cannabis use changes stress responses by altering the tetrapartite synaptic plasticity in the Nucleus accumbens core* (2025)

University of New Mexico, Albuquerque, USA: *Cannabis use changes stress responses by altering the tetrapartite synaptic plasticity in the Nucleus accumbens core* (2025)

Marshall University, USA: *Cannabis use changes stress responses by altering the tetrapartite synaptic plasticity in the Nucleus accumbens core* (2024)

University of California, Irvine: *Cannabis use changes stress responses by altering the tetrapartite synaptic plasticity in the Nucleus accumbens core* (2024)

Stress Neurobiology Workshop; Boston: *Cannabis use changes stress responses by altering the tetrapartite synaptic plasticity in the Nucleus accumbens core* (2024)

Medical University of South Carolina Neuroscience Works in Progress: *Cannabis use changes stress responses by altering the tetrapartite synaptic plasticity in the Nucleus accumbens core* (2024)

Louisiana State University Health Sciences Center-New Orleans; Alcohol & Drug Abuse Center of Excellence: *Cannabis use changes stress responses by altering the tetrapartite synaptic plasticity in the Nucleus accumbens core* (2024)

University Laval, Canada, Neuroscience Colloquium: *Cannabis use changes stress responses by altering the tetrapartite synaptic plasticity in the Nucleus accumbens core* (2024)

Mohammed V University, Morocco: *Cannabis use exacerbates conditioned stress responses* (2022)

Medical University of South Carolina Neuroscience Works in Progress: *Extracellular Matrix, Stress and Addiction* (2022)

Medical University of South Carolina Neuroscience Works in Progress: *Cannabis use exacerbates conditioned stress responses* (2021)

Medical University of South Carolina Neuroscience Works in Progress: *Effect of acute stress and stress conditioned-cues on matrix metalloproteinases in the nucleus accumbens core* (2020)

Cold Spring Harbor Neuroscience of Addiction course: *The effect of an acute stress on cannabis self-administration in rats* (2019)

Medical University of South Carolina: *The influence of N-Acetylcysteine on the motivation to self-administer cocaine in rats* (2018)

University of Nebraska-Lincoln: *The influence of N-Acetylcysteine on the motivation to self-administer cocaine in rats* (2018)

SKILLS AND TECHNIQUES

Laboratory skills:

- Surgeries: Implantation of indwelling intrajugular catheter, and stereotaxic surgery in rats
- Self-administration: Long Access, Intermittent Access, Progressive Ratio, Second Order schedules of reinforcement, Extinction-reinstatement
- Intracranial self-stimulation: Curve-shift paradigm
- Psychomotor sensitization
- Immunohistochemistry
- Confocal microscopy

Language

- French (Native)
- English (Full professional proficiency)

Computer literacy:

- Pack Office [Excel, Word, PowerPoint, Outlook];
- Med-PC IV, Graphpad Prism, SPSS, Adobe Illustrator
- Imaris

RESEARCH EXPERIENCE

Assistant Professor 2026-Present
Department of Psychology
University at Albany

Research Assistant Professor 2024-2026
Department of Neuroscience
Medical University of South Carolina

Post-Doctoral Scholar 2019-2024
Medical University of South Carolina/ Supervisor: Dr Peter Kalivas

Doctoral candidate, Neuropharmacology 2014-2019
Université de Montréal/ Supervisor: Dr Pierre-Paul Rompré

Project: **Influence of N-acetylcysteine on motivation to self-administer cocaine in rats**

- Assessed the effect of N-acetylcysteine on the development and expression of motivation to self-administer cocaine
- Evaluated the impact of an acute N-acetylcysteine injection on cocaine-induced behavioral sensitization
- Determined the effect of an acute N-acetylcysteine injection on brain stimulation reward
- Supervision of trainee students

Graduate student, Neuropharmacology 2013
Inserm U 1084, Laboratoire de Neurosciences Expérimentales et Cliniques (LNEC), University of Poitiers/ Supervisor: Dr David Belin and Dr Jennifer Murray

Project: **Influence of N-acetylcysteine on heroin seeking behavior**

- Assessed the impact of N-acetylcysteine on early- and late-stage heroin seeking

Graduate student, Neurosciences 2012
Inserm U 1084, Laboratoire de Neurosciences Expérimentales et Cliniques (LNEC), University of Poitiers/ Supervisor: Dr Laetitia Prestoz

Project: **Expression of axon guidance molecule in grafted embryonic cells in a mouse model of Parkinson's Disease**

- Detected by immunohistochemistry the grafted embryonic cells
- Detected by in situ hybridization the expression of axon guidance molecule in grafted embryonic cells

TEACHING EXPERIENCE

Courses Director of the Medical University of South Carolina Neuroscience Camp 2024

Teaching assistant 2022-Present
Neuroanatomy courses for first-year medical and graduate students at the Medical University of South Carolina

Guest lecturer at the Mohammed V University Morocco 2022
Using chemogenetics to interrogate the role of brain regions and pathways in behavior

GRANTS/FUNDING

Funded

NIDA: K99/R00 2024-Present
Title: Neurobiological mechanisms underlying changes in PTSD-like symptoms after cannabis use. Role: PI

Specialized Center of Research Excellence (SCORE) on Sex Differences 2025-Present
Title: Influence of the estrous cycle on coping strategies and multipartite synaptic plasticity induced by stress and cannabis use. Role: PI

Collectivite Territorial de Martinique $48,000 2014-2016
Title: Influence of N-acetylcysteine on motivation to self-administer cocaine in rats. Role: PI

Collectivite Territorial de Martinique $16,000 2017-2018
Title: Influence of N-acetylcysteine on motivation to self-administer cocaine in rats. Role: PI