

BIOGRAPHICAL SKETCH

NAME Rodrigo Grassi-Oliveira https://orcid.org/0000-0001-9911-5921		POSITION TITLE Associate Professor in Translational Psychiatry with Tenure at Aarhus University Professor of Psychiatry with Tenure at PUCRS	
EDUCATION/TRAINING			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
School of Medicine, Federal University of Health Sciences of Porto Alegre (UFCSPA), RS, Brazil	M.D.	12/2001	Medicine
Federal University of Health Sciences of Porto Alegre (UFCSPA), RS, Brazil	Residency	12/2003	Psychiatry
Pontifical Catholic of Rio Grande do Sul (PUCRS), RS, Brazil	M.Sc.	07/2004	Psychology
McLean Hospital, Harvard Medical School , Boston, USA & Pontifical Catholic of Rio Grande do Sul (PUCRS), RS, Brazil	Ph.D	11/2007	Psychobiology
Institute of Psychiatry, University of São Paulo , SP, Brazil	Research Fellowship	12/2010	Biological Psychiatry
Queensland Brain Institute, The University of Queensland , Brisbane, Australia	Research Fellowship	07/2013	Translational Neuroepigenetics
Psychiatry Department, Federal University of São Paulo , SP, Brazil	Habilitation DSc(med)	12/2014	Biological Psychiatry
Visiting Professor Department of Pharmacological and Biomolecular Sciences, University of Milan , Milan, Italy	Visiting Professor	08/2018	Neuropharmacology

A. Personal Statement

As an Associate Professor of Translational Neuropsychiatry at Aarhus University's Department of Clinical Medicine and a Full Professor of Psychiatry at the Pontifical Catholic University of Rio Grande do Sul's School of Medicine, my research is dedicated to elucidating the neurobiological impacts of life adversity and addiction. With a PhD in Psychobiology and a Habilitation in Biological Psychiatry, my work integrates training in translational psychiatry, epigenetics, and neurobiology to bridge human clinical research with rodent models.

My research focuses on identifying how adverse experiences drive enduring immunological and molecular changes in the brain, thereby heightening susceptibility to addictive behaviors. Employing methodologies across animal models, human neuroimaging, and cognitive assessments, my work dissects the complex interplay between environmental influences and (epi)genetic factors, advancing our understanding of cognitive development and addiction mechanisms.

As Principal Investigator on numerous federal grants, I have led efforts to elucidate early environmental determinants of addiction and identify relevant biomarkers, demonstrating robust project management in areas from staffing to budget oversight.

With over a decade of translational research experience, this project provides an opportunity to advance our understanding of the longitudinal pathophysiological processes underlying behavioral and metabolic outcomes in response to adverse environmental factors. My expertise offers a solid foundation to address the multifaceted aims of this proposal, reinforcing my commitment to advancing knowledge in this critical field.

B. Positions, Scientific Appointments, and Honors

- Associate Professor, Department of Clinical Medicine, Aarhus University, Denmark (2021-current)
- Full Professor, School of Medicine, Pontifical Catholic of Rio Grande do Sul, Brazil (2022-current)
- Associate Professor, School of Medicine, Pontifical Catholic of Rio Grande do Sul, Brazil (2018-2022)
- Associate Professor, Department of Psychology, Pontifical Catholic of Rio Grande do Sul, Brazil (2008-2018)
- Assistant Professor, Department of Pharmacology, Federal University of Rio Grande do Sul, Brazil (2008)
- Research Fellow, Institute of Psychiatry at University of São Paulo, São Paulo, SP, Brazil (2010-2011)
- Supervisor of the Postgraduate Program in Psychology, Pontifical Catholic University of Rio Grande do Sul, Porto Alegre, RS, Brazil (2009-present)
- Head of Centre of Studies and Research in Traumatic Stress (NEPTE), PTSD Outpatient Program, Pontifical Catholic University of Rio Grande do Sul, Porto Alegre, RS, Brazil (2009-2021)
- Head of Development Cognitive Neuroscience Lab (DCNL), Pontifical Catholic University of Rio Grande do Sul, Porto Alegre, RS, Brazil (2009-present)
- Doctoral Fellow with Martin H. Teicher and Susan Andersen, Developmental Biopsychiatry Research Program (DBRP), McLean Hospital/Harvard Medical School, Belmont, MA (2006-2007)
- Residency Preceptor of Clinical Psychiatry, Maternal and Child Hospital of Federal University of Health Sciences of Porto Alegre, RS, Brazil (2005-2006)
- Research Associate with Moises E. Bauer, Stress Immunology Laboratory, Pontifical Catholic University of Rio Grande do Sul, Porto Alegre, RS, Brazil (2004-2006)
- Graduate Student with Lilian M. Stein, Cognitive Process Laboratory, Pontifical Catholic University of Rio Grande do Sul, Porto Alegre, RS, Brazil (2002- 2007)
- Research Assistant under Helena M.T. Barros, Psychopharmacology Laboratory, Federal University of Health Sciences of Porto Alegre, RS, Brazil (1996-2000)

Positions of Trust

Scientific organizations (from 2020)

- *Board, Scientific Program Committee, Society of Biological Psychiatry (USA) (2023-current)*
- *Member, Neurodevelopmental Column, Neuroscience Academy Denmark (2023-current)*
- *Chair, International Travel Award Committee, Society of Biological Psychiatry (USA) (2020-2022)*
- *Treasurer, Danish Society for Extracellular Vesicles (2021-2022)*
- *Board, International Travel Award Committee, Society of Biological Psychiatry (USA) (2019-2021)*

Editorial Work

- *Associate Editor: Acta Neuropsychiatrica, BMC Neuroscience, Frontiers in Psychiatry, Chronic Stress*
- *Editorial Board: Pharmacological Research – Reports, Trends in Psychiatry and Psychotherapy, Brazilian Journal of Psychiatry*
- *Reviewer in 40+ journals, ca 500 papers (including several high-impact journals).*

Academic reviewing:

- *29 PhD/doctoral theses, 10 academic positions (Assoc professor/professor)*

Member of evaluation panels for the following granting agencies

- *National Science Centre (Narodowe Centrum Nauki – NCN), 2020, Poland.*

- The Brazilian National Council for Scientific and Technological Development, 2012-current, Brazil.
- Foundation for the Coordination and Improvement of Higher Level or Education Personnel (Capes), 2017-current, Brazil.
- PRIN 2017 for Italian Ministry of Education, 2019, Italy.
- Mental Health “La Marató” organized by TV3 (2022), Spain.
- The Luxembourg National Research Fund (Fonds National de la Recherche - FNR) (2021), Luxembourg
- Medical Research Council (2021-2023), United Kingdom.

Aarhus University

- *Member, EVAnet (the network of Extracellular Vesicle research in Aarhus) (2024-current)*
- *Organizer, Associate Professor Network (2024-current)*
- *Board, Steering Committee of Food & Nutrition Network (2023-current)*
- *Associate Fellow, Aarhus Institute of Advanced Studies (2021-current)*

Honors and Awards

- Productivity Researcher Award Category I of the National Council for Scientific and Technological Development, Brazilian Federal Government, Brasília, DF, Brazil. 2019
- CAPES Distinguished Dissertation Award in Genetics (Co-Supervisor), National Prize, Brazilian Government (CAPES), Brasília, DF, Brazil. 2018
- Productivity Researcher Category I of the National Council for Scientific and Technological Development, Brazilian Federal Government, Brasília, DF, Brazil. 2015
- National Institute on Drug Abuse (NIDA) International Program Travel Award, San Juan, Puerto Rico. 2014
- Habilitation (professorship) with distinction, Department of Psychiatry, Federal University of São Paulo, São Paulo, SP, Brazil. 2014
- Distinguished Honors in Research, Brazilian Institute of Neuropsychology and Behavior (IBNeC), Rio de Janeiro, RJ, Brazil. 2013
- Researcher Category II of the National Council for Scientific and Technological Development, Brazilian Federal Government, Brasília, DF, Brazil. 2012
- Distinguished Honors in Research, Brazilian Institute of Neuropsychology and Behavior (IBNeC), Rio de Janeiro, RJ, Brazil. 2012
- Distinguished Honors in Research, Brazilian Institute of Neuropsychology and Behavior (IBNeC), Rio de Janeiro, RJ, Brazil. 2011
- CAPES Distinguished Dissertation Award in Psychology, National Prize, Brazilian Government (CAPES), Brasília, DF, Brazil. 2009
- ISTSS Travel Award, International Society for Traumatic Stress Studies (ISTSS), Chicago, IL, USA. 2008
- Best Oral Presentation Award, Brazilian Psychiatric Association (ABP), Goiânia, GO, Brazil. 2003
- José Lemmertz Award, Distinguished Honors in Research, Department of Psychiatry, Federal University of Health Sciences of Porto Alegre (UFCSPA), Porto Alegre, RS, Brazil. 2000
- Bruno Russomano Mendoça Lima Award for best student, Department of Psychiatry, Federal University of Health Sciences of Porto Alegre (UFCSPA), Porto Alegre, RS, Brazil. 1999

C. Recent Funding

Total amount raised since 2022: **12.780.079 kr**, including **2.438.202 kr** in overhead for the Department

- 2024-2027 DFF | Tematisk forskning – Bedre rammer for psykiatrien (2023): 3.101.020 kr.
- 2023-2027 Lundbeckfoundation | Ascending Investigators 2023: 5.261.254 kr
- 2022-2026 HORIZON EUROPE 2021 | Stay Healthy: 3.487.760 kr
- 2023-2024 Lundbeckfoundation | Medical Research Year: 164.000 kr

- 2024 AUFF | International mobilitet: 47.000 kr
- 2022-2023 CNPq: 161.302 kr
- 2024-2026 CNPq: 268.134 kr
- 2024-2028 CNPq: 93.603 kr
- 2022-2023 Riisfort-Fonden: 196.006 kr

D. Invited Keynote Lectures

- *Exploring the Impact of Maternal High-Fat Diet on μ -Opioid Receptor Development and Its Role in Childhood Obesity and Adolescent Anhedonia.* ENDO 2024. Boston. 01/06-04/06/2024.
- *Molecular Mechanisms Regulating Stress Integrative Neural Networks – Novel Translational Insight into the Neurobiology of Stress Vulnerability.* 2024 Molecular Psychiatry Association. 06/03-09/03/2024
- *Epigenetics of Cocaine Use Disorder: Collaborative Case-Control Initiative In Cocaine Addiction.* 2024 International Drug Abuse Research Society Meeting. Rio de Janeiro. 29/04-03/05/2024
- *Can maternal high fat diet disrupt the development of μ -opioid receptors inducing childhood overweight and anhedonia in adolescence? 50th MEETING European Brain and Behaviour Society.* Amsterdam. 26/08-29/08/2023
- *How Maternal Stress Shapes Offspring Brain Development and Behavior: Integrating Behavioral, Neurobiological, and Molecular Data from Clinical and Preclinical Studies.* 2022 Winter Conference on Brain Research. Aspen. 30/01/22-04/02/2022, USA.
- *Early-Life and Adult Stress Vulnerability and Innovative Strategies for Prevention.* 74th Society of Biological Psychiatry (SOBP) Annual Meeting. May 16-18, 2019, Chicago, USA.
- *Bundling the Haystacks and Finding the Needle: Enhancing Rigor and Reproducibility in Early Life Stress Research.* 59th Annual Meeting of the American College of Neuropsychopharmacology. Dec 09 - 13, 2018. Hollywood, FL, USA.
- *Disrupted maternal care and immune dysregulation in the PFC of rodents.* The 40th Annual Meeting of the Japan Neuroscience Society. July 20-23, 2017. Chiba-city, Japan.

E. International Collaborations

95% of my papers are with international partners, and I have published with colleagues from European countries, USA, Canada, Australia, China and Brazil. My research lab hosts several international ERASMUS students every year. We had an international collaboration with PUCRS (Brazil) where several students and staff constantly exchange research and education.

I have coordinated a 5 million R01 NIH grant with intense collaboration between the USA and Brazil, recently including Denmark.

- Member, Society of Biological Society (SOBP)
- Member, European College of Neuropsychopharmacology (ECNP)
- Member of the Institutional Review Board (IRB) of PUCRS
- Associate Editor – Acta Neuropsychiatrica
- Associate Editor – BMC Neuroscience
- Associate Editor – Frontiers in Psychiatry
- Editorial Board – Chronic Stress
- SOBP's Program Committee 2022-2024
- SOBP's International Travel Award Committee 2020-2022
- *Grant Reviewer:* National Science Centre (Narodowe Centrum Nauki – NCN), 2020, Poland.
- *Grant Reviewer:* The Brazilian National Council for Scientific and Technological Development, 2012-2020, Brazil.
- *Grant Reviewer:* Foundation for the Coordination and Improvement of Higher Level or Education Personnel (Capes), 2017-2020, Brazil.
- *Grant Reviewer:* PRIN 2017 for Italian Ministry of Education, 2019, Italy.

- *Board Committee and Grant Reviewer:* Mental Health projects for “La Marató” organized by TV3 (2022), Spain.
- *Grant Reviewer:* The Luxembourg National Research Fund (Fonds National de la Recherche - FNR) (2021), Luxembourg
- *Grant Reviewer:* Medical Research Council (2021-2023), United Kingdom.
- *Grand Reviewer:* Wellcome Trust (2024), United Kingdom.

F. Contributions to Science

Contribution 1: Building the Largest Genetic and Epigenetic Brazilian Cohort of Cocaine Users

At the time of my research, there was a significant gap in understanding the clinical phenotypes and underlying mechanisms associated with cocaine use disorder. To address this knowledge gap, I embarked on the task of building the largest Brazilian cohort of cocaine users, aiming to provide detailed clinical phenotypes and integrate various molecular and neuroimaging data, including data related to exposomics and HIV-1 infection.

Through establishing this cohort, we have collected a wealth of data, including genetic information (genome-wide association studies - GWAS), epigenetic information (epigenome-wide association studies - EWAS), and neuroimaging data. These comprehensive datasets have allowed us to gain a deeper understanding of the complex nature of cocaine use disorder and its impact on brain structure and function. The availability of this extensive cohort has opened up numerous avenues for scientific discovery and advancement. By leveraging the data from this cohort, we have made significant contributions to the field, particularly in elucidating the impact of CUD on white matter disruption, accelerated cellular aging, sex differences in brain regional homogeneity during acute abstinence, and multidimensional clinical assessments of early-abstinence crack cocaine users. These findings have important implications for our understanding of addiction, brain function, and the influence of sex-based differences in the context of cocaine use disorder.

As the principal investigator, I spearheaded the establishment and coordination of this cohort. My role encompassed the design and implementation of data collection protocols, ensuring the recruitment of a diverse and representative sample, and overseeing the integration and analysis of various data modalities.

Relevant Publications:

1. Tondo et al. (2021). Convergent evidence from in vivo diffusion tensor imaging and ex vivo proteomics analysis of white matter disruption in cocaine use disorder. *Translational Psychiatry*, 11(1), 252.
2. Rothmann et al. (2024) The cortical thickness of tricenarian cocaine users assembles features of an octogenarian brain. *J Neurosci Res*;102(1):e25287.
3. Viola et al. (2024) Prenatal cocaine exposure and its influence on pediatric epigenetic clocks and epigenetic scores in humans. *Sci Rep*;14(1):1946.
4. Sanvicente-Vieira et al. (2022). Sex differences in brain regional homogeneity during acute abstinence in cocaine use disorder. *Addiction Biology*, 27(3), e13177.

Contribution 2: Oxidative and Immune Imbalance in Substance Use Disorder

The understanding of the underlying mechanisms and associated comorbidities in substance use disorder (SUD) has been a subject of extensive research. One significant area of investigation has been the examination of oxidative and antioxidative stress markers, as well as immune dysregulation, and their potential impact on cell damage and accelerated aging in individuals with SUD.

Our research has revealed compelling evidence of oxidative and immune imbalances in persons with SUD. These imbalances contribute to increased oxidative stress and compromised antioxidative defenses, potentially leading to cellular damage and the development of various comorbidities. Furthermore, our studies have demonstrated associations between SUD and accelerated cellular aging, particularly in the context of alcohol use disorder.

These findings have far-reaching implications for both the scientific understanding of SUD and its clinical implications. By uncovering the underlying mechanisms related to oxidative and immune imbalances, we can better comprehend the pathophysiology of SUD and the associated health consequences. Moreover, these findings contribute to the identification of potential therapeutic targets and interventions aimed at mitigating oxidative stress, restoring immune balance, and reducing the burden of comorbidities in individuals with SUD.

Relevant Publications:

1. Viola et al. (2023). Effects of substance use disorder on oxidative and antioxidative stress markers: A systematic review and meta-analysis. *Addiction Biology*, 28(1), e13254.
2. Martins de Carvalho et al. (2019). Effect of alcohol use disorder on cellular aging. *Psychopharmacology (Berl)*, 236(11), 3245-3255.
3. Sanvicente-Vieira et al. (2016). Crack-cocaine dependence and aging: Effects on working memory. *Brazilian Journal of Psychiatry*, 38(1), 58-60.
4. Zaparte et al. (2019). Cocaine Use Disorder Is Associated With Changes in Th1/Th2/Th17 Cytokines and Lymphocyte Subsets. *Frontiers in Immunology*, 10, 2435.

Contribution 3: Exploring Transcriptional and Epigenetic Regulation in Early Life Stress and Addiction-Related Behaviors in Rodents

Understanding the molecular mechanisms underlying the interaction between early life stress (ELS) and cocaine exposure is crucial for unraveling the development of addictive behaviors. This line of research has focused on improving ELA models in rodents and investigating transcriptional and epigenetic modifications in specific brain regions implicated in reward processing and stress responses. Through animal models and molecular analyses, we have demonstrated alterations in the expression of key genes, such as NFκB in the prefrontal cortex and hippocampus of mice exposed to both ELS and cocaine during adolescence. Additionally, our research has revealed the involvement of cortical BDNF, microRNA-212, and MeCP2 in modulating cocaine-induced conditioned place preference during periadolescence. We have also investigated the impact of corticotropin-releasing factor (CRF) infusion in the bed nucleus of the stria terminalis during lactation, which has significant implications for maternal care and offspring behavioral phenotypes. Moreover, our work has highlighted the role of epigenetic regulation in mediating the effects of postnatal impoverished housing and maternal separation on risk assessment and risk-taking behaviors during adolescence.

These findings contribute to the understanding of the neurobiological mechanisms underlying the interaction between ELA and reward processing, providing insights into the development of addictive behaviors.

Relevant Publications:

1. Orso et al. Sex-specific effects of early life stress exposure on memory performance and medial prefrontal cortex transcriptomic pattern of adolescent mice, 02 September 2024, PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs-4852454/v1]
2. Orso R et al. Maternal Separation Combined With Limited Bedding Increases Anxiety-Like Behavior and Alters Hypothalamic-Pituitary-Adrenal Axis Function of Male BALB/cJ Mice. *Front Behav Neurosci*. 2020 Nov 12;14:600766. doi: 10.3389/fnbeh.2020.600766.
3. Viola et al. (2016). Increased cocaine-induced conditioned place preference during periadolescence in maternally separated male BALB/c mice: the role of cortical BDNF, microRNA-212, and MeCP2. *Psychopharmacology (Berl)*, 233(17), 3279-3288.
4. Creutzberg et al. (2020). Corticotropin-releasing factor infusion in the bed nucleus of the stria terminalis of lactating mice alters maternal care and induces behavioral phenotypes in offspring. *Scientific Reports*, 10(1), 19985.
5. Viola et al. (2019). Postnatal impoverished housing impairs adolescent risk-assessment and increases risk-taking: A sex-specific effect associated with histone epigenetic regulation of Crfr1 in the medial prefrontal cortex. *Psychoneuroendocrinology*, 99, 8-19.

Contribution 4: Human Capacity Building (completed)

- Main supervisor of Pre-graduate (Bachelors: 74, Master: 23), and Post-graduate students (PhD: 18)
- Post-docs: Main mentor: 9

Complete List of Published Work <https://pubmed.ncbi.nlm.nih.gov/?term=grassi-oliveira&sort=date>