
BIOGRAPHICAL SKETCH

NAME: Viviana Trezza

POSITION TITLE: Associate Professor, Head Pharmacology Lab, Dept. of Science, Roma Tre University

ID RESEARCHER PLATFORM AND PERSONAL AUTHOR ID: ORCID ID: 0000-0002-3922-6045

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Sapienza University of Rome, Italy	Master	03/2003	Pharmaceutical Chemistry
Sapienza University of Rome, Italy	PhD	01/2007	Pharmacology
Brain Center Rudolf Magnus, Utrecht (The Netherlands)	Researcher	05/2010	Neuropharmacology

A. Personal Statement

My research focuses on identifying novel pharmacological targets for neurodevelopmental disorders characterized by altered socio-emotional and cognitive processing, with particular emphasis on Fragile X Syndrome (FXS) and Autism Spectrum Disorder (ASD). In recent years, I have developed an integrative research framework aimed at elucidating how multiple neurotransmitter systems interact across distributed brain networks to regulate socio-emotional and cognitive functions. Within this framework, my work has explored key intracellular signaling pathways underlying behavioral dysfunctions in neurodevelopmental disorders, identifying phosphodiesterases as well as components of the endocannabinoid system among the key modulators of these processes and as promising therapeutic targets. My laboratory employs a multidisciplinary approach that combines advanced behavioral phenotyping with neurochemical and pharmacological analyses in mouse and rat models of neurodevelopmental disorders, generated through genetic, pharmacological, and environmental manipulations. This strategy enables a comprehensive investigation of the neurobiological mechanisms underlying disease-relevant behaviors, as well as the preclinical evaluation of potential therapeutic interventions. To enhance the translational relevance of this work, I have established a strong interdisciplinary network of collaborations spanning neuropsychiatry, psychology, molecular neuroscience, neuroimaging, organic chemistry, and electrophysiology. These collaborations support the development of innovative experimental and translational tools to investigate socio-emotional processes across species, effectively bridging basic neuroscience and clinical research.

B. Positions, Scientific Appointments, and Honors

Positions:

2018-to date: Associate Professor, Head of the Pharmacology Lab, Roma Tre University, full-time.

2010-2018: Assistant Professor, Head of the Pharmacology Lab, Roma Tre University, full-time.

2007-2010: Senior Researcher, Brain Center Rudolf Magnus, Utrecht, The Netherlands, full-time.

2003-2007: Ph.D. student, Dept. Physiology and Pharmacology, Sapienza University of Rome, full-time.

Scientific Appointments:

2022-to date: Coordinator of the Master in Pharmacy, Dept. Science, Roma Tre University, Rome, Italy

2026-to date: Elected member of the Council of the Mediterranean Neuroscience Society (MNS)
2025: Vice-chair for the evaluation of the 2025 Marie Skłodowska-Curie Postdoctoral Fellowships (HORIZON-MSCA-PF-2025)
2022 – 2024: Secretary and Treasurer of the Italian Society of Neuroscience (SINS)
2022-to date: Member of the working group Novel Foods for the Panel on Nutrition, Novel Foods and Food Allergens (NDA) of the European Food Safety Authority (EFSA)
2021: Member of the International Evaluation Committee of the Czech Academy of Science (CAS) for the Life Science domain.
2014-2018: Member of the Quality Assurance Committee for research, Roma Tre University, Rome, Italy

Prizes:

2016: “De Dianense Virtute” prize for citizens that reached outstanding scientific results
2013 European Behavioral Pharmacology Society (EBPS) Young Investigator Award
2010 Direct appointment at Roma Tre University (Italy). According to current Italian legislation, this recruitment process is reserved to researchers who, while appointed at foreign Universities for at least 3 years, performed excellent research in their own field leading to publications in leading international journals, demonstrated superior academic teaching, actively advised doctoral students and contributed to the intellectual life of their Institution (Decreto Ministeriale 23 settembre 2009 prot. n. 45/2009).
2008 Prize for “the best young Pharmacology Researcher” sponsored by the Italian Society of Pharmacology (SIF) for the five most promising Italian Researchers younger than 35.

Grants as PI (last 10 years only):

2024: Ministry of Health PNRR-MCNT1-2023 grant titled “Interactions between type-1 trace amine receptors and metabotropic glutamate receptors in the pathophysiology and treatment of stress-related disorders and neurodevelopmental disorders” (239000 €) ONGOING
2023: Jerome Lejeune Foundation Research grant, titled “Phytocannabinoids in Fragile X syndrome: shedding light on therapeutic potential and mechanisms” (50000 €) ONGOING
2023: PRIN grant, MIUR, titled “Dissecting the pharmacological mechanisms underlying the therapeutic potential of phytocannabinoids in autism” (232400 €) COMPLETED
2021: Bando Regione Lazio Progetti di Gruppi Ricerca 2020, titled “Endocannabinoids in autism spectrum disorder” (149893 €) COMPLETED
2019: PRIN grant, MIUR, titled “Early life social experiences and dysregulation of the brain reward system: The role of endocannabinoid transmission” (128000€) COMPLETED
2019: Autism Speaks organization grant for postdoctoral fellow, titled “New insights on the role of cannabidiol in autism spectrum disorder: from synapse to behavior” (135000 \$) COMPLETED
2017: Jerome Lejeune Foundation Research grant, titled “The endocannabinoid system as a novel therapeutic target for Fragile X syndrome” (40000 €) COMPLETED

C. Contributions to Science

Total number of publications in peer-reviewed international journals: 140
Total citations: 10027 (Scopus); updated on 02/04/2026
Hirsch (H) index: 54 (Scopus); updated on 02/04/2026; First publication: 2005; two maternity leaves.

1. Phosphodiesterase inhibitors and psilocybin as new therapeutic tools in FXS:

Recently, my research has expanded to the study of phosphodiesterase-dependent regulation of cyclic nucleotide signaling, identifying phosphodiesterase 2A (PDE2A) as a key molecular regulator of socio-emotional and cognitive functions relevant to FXS. Through pharmacological and behavioral approaches in validated preclinical models, my work contributed to the preclinical validation of PDE2A as a potential therapeutic target for FXS, highlighting the role of cyclic nucleotide signaling dysregulation in the disorder. In parallel, I contributed to the preclinical investigation of psilocybin as a novel therapeutic approach for FXS, further exploring pharmacological strategies aimed at restoring altered neural signaling and behavioral phenotypes. The main publications related to this line of research are listed below:

- a) Ascone F, ... **Trezza V.** (2026) Psilocybin improves novel object recognition in a rat model of Fragile X Syndrome through the modulation of the BDNF/TrkB signaling pathway. *Neuropsychopharmacology*, 2026 Feb 13. doi: 10.1038/s41386-026-02361-x. IF: 7.1;
- b) Schiavi S., ... **Trezza V.** (2022) Phosphodiesterase 2A inhibition corrects the aberrant behavioral traits observed in genetic and environmental preclinical models of Autism Spectrum Disorder. *Translational Psychiatry*, 12(1):119, doi.org/10.1038/s41398-022-01885-2. IF: 7.989;
- c) Maurin T., ... **Trezza V.**, Bardoni B. (2019) Involvement of Phosphodiesterase 2A activity in the pathophysiology of Fragile X Syndrome. *Cerebral Cortex*, 29(8):3241-3252; IF: 6.308;
- d) Delhaye S., ..., **Trezza V.**, Pellegrini M., Maurin T., Lalli E., Bardoni B. (2024) Defects in AMPAR trafficking and microglia activation underlie socio-cognitive deficits associated to decreased expression of Phosphodiesterase 2A. *Neurobiology of Disease*, 191:106393. IF: 6.1;

2. Role of the endocannabinoid system in ASD and Fragile X syndrome (FXS): Building on my long-standing expertise in endocannabinoid pharmacology, I investigated the role of endocannabinoid signaling in the behavioral alterations observed in environmental (prenatal exposure to valproic acid, VPA) and genetic (*Fmr1-Δexon 8*) rat models of ASD, the latter also modeling FXS. These studies demonstrated that different components of the endocannabinoid system are altered in several brain areas of these animal models. Furthermore, I also investigated the effects and mechanisms of action of different phytocannabinoids in the *Fmr1-Δexon 8* rat model of FXS.

The main publications related to this line of research are listed below:

- e) Rava A., ... **Trezza V.** (2025) Role of peroxisome proliferator-activated receptors α and γ in mediating the beneficial effects of β -Caryophyllene in a rat model of Fragile X Syndrome. *Progress in Neuropsychopharmacology & Biological Psychiatry*, 136:111234. doi: 10.1016/j.pnpbp.2024.111234. IF: 5.3;
- f) Manzoni OJM, Manduca A., **Trezza V.** (2025) Therapeutic Potential of Cannabidiol Polypharmacology in Neuropsychiatric Disorders. *Trends in Pharmacological Sciences*, 46;2:145-162. IF: 19.9;
- g) Manduca A., ... **Trezza V.** (2024) Cannabidiol and positive effects on object recognition memory in an in vivo model of Fragile X Syndrome: obligatory role of hippocampal GPR55 receptors. *Pharmacological Research*, Apr 5;203:107176. IF: 9.3;
- h) Schiavi S., ... **Trezza V.** (2023) Anandamide and 2-arachidonoylglycerol differentially modulate autistic-like traits in a genetic model of autism based on FMR1 deletion in rats. *Neuropsychopharmacology*. 2023 May;48(6):897-907. IF: 8.294;

3. Validation and characterization of new animal models of FXS: I validated the *Fmr1-Δexon 8* rats as a genetic rat model of FXS and characterized its neuropathological features. Furthermore, I provided an extensive behavioral characterization of a knock-in mouse model (*Fmr1R138Q*) carrying the FMRP-R138Q mutation observed in a subset of FXS patients:

- i) Rava A., ... **Trezza V.** (2026) Hippocampal glial alterations are associated with Lamin B1 dysregulation and abnormal nuclear morphology in a rat model of fragile X syndrome. *Neurobiology of Disease*, Feb 4;220:107304. doi: 10.1016/j.nbd.2026.107304. IF: 5.6;
- j) D'Elia A., .. **Trezza V.** (2022) FMR1 deletion in rats induces hyperactivity with no changes in striatal dopamine transporter availability. *Scientific Reports*, Dec 29;12(1):22535. IF: 4.996;
- k) Prieto M., ... **Trezza V.**, Martin S. (2021) Missense mutation of Fmr1 results in impaired AMPAR-mediated plasticity and socio-cognitive deficits in mice. *Nature Communications*, 12(1):1557. IF: 14.919;
- l) Schiavi S., **Trezza V.** (2020) Perinatal supplementation with omega-3 fatty acids corrects the aberrant social and cognitive traits observed in a genetic model of autism based on FMR1 deletion in rats. *Nutritional Neuroscience*, 2020 Sep 11:1-14. IF: 5.00;

4. Corticolimbic brain regions underlying social behavior: funded by a Veni grant from NWO/ZonMw and by a Marie Curie Career Reintegration grant, I identified the limbic brain regions where endogenous opioids, endocannabinoids and dopamine modulate the rewarding aspects of social interaction in adolescent rats. Furthermore, the analysis of immediate early gene expression patterns after social interaction showed increases in c-fos expression in the prelimbic cortex, dorsal striatum and nucleus accumbens. I also clarified the impact of drugs of abuse on social behavior. The main publications related to this line of research are listed below:

- m) Manduca A., **Trezza V** (2021) The neurochemistry of social reward during development: what have we learned from rodent models? *Journal of Neurochemistry*, 157(5):1408-1435. IF: 5.372;
- n) Manduca A., **Trezza V.** (2016) Dopaminergic neurotransmission in the nucleus accumbens modulates social play behavior in rats. *Neuropsychopharmacology*, 41(9):2215-23; IF: 7.1;
- o) **Trezza V.**, et al. (2012) Endocannabinoids in amygdala and nucleus accumbens mediate social play reward in adolescent rats. *The Journal of Neuroscience*, 32(43):14899-908;
- p) **Trezza V.**, et al. (2011) Nucleus accumbens μ -opioid receptors mediate social reward. *The Journal of Neuroscience*, 31(17):6362-70;

5. New physiological roles of endocannabinoids and related N-acylethanolamines: My studies contributed to shed light on the role of endocannabinoids and related N-acylethanolamines in energy balance, memory consolidation and emotional states. Furthermore, my research helped to clarify the key role of endocannabinoids in brain development and shed light on the consequences of developmental exposure to *Cannabis*.

- q) Meye F.J., **Trezza V.**, et al. (2013) Neutral antagonism at the cannabinoid 1 receptor: A safer treatment for obesity. *Molecular Psychiatry*, 18(12):1294-301;
- r) Campolongo P., Roozendaal B., **Trezza V.**,, Piomelli D. (2009) The fat-induced satiety factor OEA enhances memory consolidation. *Proc Natl Acad Sci USA*, 106(19):8027-31;
- s) Manduca A.,, **Trezza V.** (2020) Sex-specific behavioral deficits induced at early life by prenatal exposure to the cannabinoid receptor agonist WIN 55,212-2 depend on mGlu5 receptor signaling. *British Journal of Pharmacology*, 177(2):449-463; IF: 8.74;
- t) Scheyer A.F., Melis M., **Trezza V.**, Manzoni O. (2019) Consequences of perinatal cannabinoid exposure. *Trends in Neuroscience*, 42(12):871-884; IF: 12.891

Complete List of Published Work at:

<https://pubmed.ncbi.nlm.nih.gov/?term=trezza+v&sort=date>