Elenco progetti_pubblicazioni con finanziamenti

Responsabile del Progetto Prof.ssa MELIS MIRIAM

Titoli dei progetti riguardanti la sperimentazione animale finanziati dal 2019 ad oggi

- 2020-2022/ FISR (MIUR): Offset damages evoked by prenatal THC exposure: a multidisciplinary approach addressing the effects of maternal nutrition supplements- Ruolo PI- UniCa: € 383.861,76
- 2019-2021/ PoC (MIUR): Caratterizzazione delle proprietà specifiche dell'acido linoleico coniugato (CLA) in forma fosfolipidica per il trattamento di patologie psichiatriche a base neuro-infiammatoria e individuazione di biomarcatori dell'efficacia terapeutica- Ruolo co-PI- Unica: € 282.420
- 2019-2021/ RAS: Interazione gene-ambiente e comportamento aggressivo: studio preclinico e clinico sul ruolo del sistema dopaminergico e su possibili target terapeutici- Ruol0 PI- Unica: €110000
- 2018-2023/ NIDA (USA): Neurodevelopmental effects of THC on the VTA dopamine system and behavior- Ruolo Co-PI- Unica: 260.591 USD

Pubblicazioni con coinvolgimento CeSAst 2019-21:

1. Ciccocioppo R, de Guglielmo G, Li H, **Melis M**, Caffino L, Shen Q, Domi A, Fumagalli F, Demopulos G, and Gaitanaris G (2021) Selective inhibition of phosphodiesterase 7 enzymes reduces motivation for nicotine use through modulation of mesolimbic dopaminergic transmission. J Neurosci.;41(28):6128-43

2. Traccis F, Serra V, Sagheddu C, Congiu M, Saba P, Giua G, Devoto P, Frau R, Cheer J, **Melis M** (2021) Prenatal THC does not affect female mesolimbic dopaminergic system in preadolescent rats. Int J Molec Sci. 22(4):1666.

3. Sagheddu C, Traccis F, Serra V, Congiu M, Frau R, Cheer JF, **Melis M** (2021) Mesolimbic dopamine dysregulation as a signature of information processing deficits imposed by prenatal THC exposure. Prog Neuro-psych Bio Psych, Volume 105, DOI: 10.1016/j.pnpbp.2020.110128 I

4. Medrano MC, Hurel I, Mesguich E, Redon B, Stevens C, Georges F, **Melis M**, Marsicano G, Chaouloff G (2020) Exercise craving potentiates excitatory inputs to ventral tegmental area dopaminergic neurons. Addict Biol, Addict Biol, 26(3):e12967.

5. Traccis F, Frau R, **Melis M** (2020). Gender differences in the outcome of offspring prenatally exposed to drugs of abuse. Front. Behav. Neurosci., https://doi.org/10.3389/fnbeh.2020.00072.

6. Frau R, Miczán V, Traccis F, Aroni S, Pongor CI, Saba P, Serra V, Sagheddu C, Fanni S, Congiu M, Devoto P, Cheer JF, Katona I, **Melis M** (2019). Prenatal THC exposure produces a hyperdopaminergic phenotype rescued by pregnenolone. Nature Neuroscience. 22: 1975–1985; DOI: 10.1038/s41593-019-0512-2.

7. De Felice M, **Melis M**, Aroni S, Muntoni AL, Fanni S, Frau R, Devoto P, Pistis M (2019) The PPARα agonist fenofibrate attenuates disruption of dopamine function in a maternal immune activation rat model of schizophrenia. CNS Neurosci Ther. 25(5):549-561. doi: 10.1111/cns.13087.

8. Cadoni C, De Felice M, Corongiu S, Dessì C, Espa E, **Melis M**, Fenu, S (2019) Role of genetic background in the effects of adolescent nicotine exposure on mesolimbic dopamine transmission. Addict Biol doi: 10.1111/adb.12803.

9. Frau R, Fanni S, Serra V, Simola N, Godar SC, Traccis , Devoto P, Bortolato M, **Melis M** (2019) Dysfunctional mesocortical dopamine circuit at pre-adolescence is associated to aggressive behavior in MAO-A hypomorphic mice exposed to early life stress. Neuropharmacol. doi: 10.1016/j.neuropharm.2019.01.032

10. Godar SC, Mosher LJ, Scheggi S, Devoto P, Moench KM, Strathman HJ, Jones CM, Frau R, **Melis M**, Gambarana C, Wilkinson B, De Montis MG, Fowler SC, Coba MP, Wellman CL, Shih JC, Bortolato M (2019) Gene-environment interactions in antisocial behavior are mediated by early-life 5-HT2A receptor activation. Neuropharmacol. doi: 10.1016/j.neuropharm.2019.01.028

Responsabile del Progetto Dott.ssa VALENTINA BASSAREO

Pubblicazioni con coinvolgimento CeSAst 2019-21:

Ethanol-Dependent Synthesis of Salsolinol in the Posterior Ventral Tegmental Area as Key Mechanism of Ethanol's Action on Mesolimbic Dopamine.
Bassareo V, Frau R, Maccioni R, Caboni P, Manis C, Peana AT, Migheli R, Porru S, Acquas E.Front Neurosci. 2021 Jun 28;15:675061. doi: 10.3389/fnins.2021.675061. eCollection 2021.PMID: 34262429 **Free PMC article.**

Chronic Red Bull Consumption during Adolescence: Effect on Mesocortical and Mesolimbic Dopamine Transmission and Cardiovascular System in Adult Rats.
Vargiu R, Broccia F, Lobina C, Lecca D, Capra A, Bassareo PP, **Bassareo V.** Pharmaceuticals (Basel). 2021 Jun 24;14(7):609. doi: 10.3390/ph14070609.PMID: 34202876 **Free PMC article.**

The biologically active compound of *Withania somnifera* (L.) Dunal, docosanyl ferulate, is endowed with potent anxiolytic properties but devoid of typical benzodiazepine-like side effects.
Maccioni R, Cottiglia F, Maccioni E, Talani G, Sanna E, **Bassareo V**, Kasture SB, Acquas E.J Psychopharmacol. 2021 May 3:2698811211008588. doi: 10.1177/02698811211008588. Online ahead of print.PMID: 33934670

Nicotine, cocaine, amphetamine, morphine, and ethanol increase norepinephrine output in the bed nucleus of stria terminalis of freely moving rats.
Jadzic D, **Bassareo V**, Carta AR, Carboni E.Addict Biol. 2021 Jan;26(1):e12864. doi: 10.1111/adb.12864. Epub 2019 Dec 17.PMID: 31849152

Effects of caffeine on ethanol-elicited place preference, place aversion and ERK phosphorylation in CD-1 mice.
Porru S, Maccioni R, **Bassareo V**, Peana AT, Salamone JD, Correa M, Acquas E.J Psychopharmacol. 2020 Dec;34(12):1357-1370. doi: 10.1177/0269881120965892. Epub 2020 Oct 24.PMID: 33103552

Inhibition of Morphine- and Ethanol-Mediated Stimulation of Mesolimbic Dopamine Neurons by *Withania somnifera*.
Bassareo V, Talani G, Frau R, Porru S, Rosas M, Kasture SB, Peana AT, Loi E, Sanna E, Acquas E.Front Neurosci. 2019 Jun 4;13:545. doi: 10.3389/fnins.2019.00545. eCollection 2019.PMID: 31275092 **Free PMC article.**

Responsabile del Progetto Dott.ssa PAOLA DEVOTO

Titoli dei progetti riguardanti la sperimentazione animale finanziati dal 2019 ad oggi

Progetto intitolato "Interazioni dopamina-noradrenalina nella corteccia prefrontale mediana del ratto", finanziato dal *Guy Everett Laboratory for Neuroscience*, responsabile prof. Gian Luigi Gessa. Finanziamento: 11.480 € annui

Pubblicazioni con coinvolgimento CeSAst 2019-21:

- **Devoto P**, Sagheddu C, Santoni M, Flore G, Saba P, Pistis M and Gessa GL (2020) Noradrenergic Source of Dopamine Assessed by Microdialysis in the Media Prefrontal Cortex. Front. Pharmacol. 11:588160. doi: 10.3389/fphar.2020.588160
- **Devoto P**, Flore G, Saba P, Scheggi S, Mulas G, Gambarana C, Spiga S, Gessa GL (2019) Noradrenergic terminals are the primary source of α_2-adrenoceptor mediated dopamine release in the medial prefrontal cortex. Progr Neuropsychopharm Biol Psy 90:97–103. https://doi.org/10.1016/j.pnpbp.2018.11.015. Available Online 11-23-2018

Inoltre, a seguito dei risultati ottenuti nel progetto di ricerca sunnominato, è stata presentata e accettata la domanda di Brevetto internazionale n. PCT/IB2019/058285 del 30/09/2019 dal titolo: "(8aR,12aS,13aS)-5,8,8a,9,10,11,12,12a,13,13a- DECA-HYDRO-3-METHOXY-12-(ETHYLSULPHONYL)-6H-ISOQUINO[2,1-g] [1,6] NAPHTHYRIDINE COMPOUND FOR USE IN THE TREATMENT OF PSYCHOSES" facente seguito al brevetto nazionale n. 102018000009072 dell'01/10/2018. La domanda di brevetto extra-UE è tutt'ora in corso di esame

Responsabile del Progetto Prof. MARCO PISTIS

Titoli dei progetti riguardanti la sperimentazione animale finanziati dal 2019 ad oggi

1) RAS, Progetti di Ricerca Fondamentale o di Base- L.R. 7/2007 (Promozione della Ricerca Scientifica e dell'Innovazione Tecnologica in Sardegna), 2018 'Terapie farmacologiche innovative e approccio nutraceutico per la neuroinfiammazione nelle patologie psichiatriche e neurodegenerative'. (Coordinatore) Finanziamento UNICA : **€ 110.000**

2) Proof of Concept 2018 (Ministero dell'Istruzione, dell'Università e della Ricerca) "Characterization of specific properties of conjugated linoleic acid (CLA) in phospholipid form for the treatment of psychiatric disorders with neuroinflammatory basis, and identification of biomarkers of its therapeutic efficacy" (Co-PI, Resp. prof. Sebastiano Banni). Finanziamento UNICA **€ 197.400**

3) PRIN2017 (Ministero dell'Istruzione, dell'Università e della Ricerca) "Bioenergetics and inflammation: novel insights for new therapeutic approaches in Alzheimer's Disease" Prot. 2017YH3SXK (Coordinatore Nazionale e Responsabile dell'Unità di Ricerca locale). Finanziamento UNICA: **€ 190.000**

Pubblicazioni con coinvolgimento CeSAst 2019-21:

1. Congiu, M., L. Micheli, M. Santoni, C. Sagheddu, A.L. Muntoni, A. Makriyannis, M.S. Malamas, C. Ghelardini, L. Di Cesare Mannelli, and **M. Pistis**, *N-Acylethanolamine Acid Amidase Inhibition Potentiates Morphine Analgesia and Delays the Development of Tolerance.* **Neurotherapeutics**, 2021.

3. Lubec, J., P. Kalaba, A.M. Hussein, D.D. Feyissa, M.H. Kotob, R.R. Mahmmoud, O. Wieder, A. Garon, C. Sagheddu, M. Ilic, V. Dragacevic, A. Cybulska-Klosowicz, M. Zehl, J. Wackerlig, S.B. Sartori, K. Ebner, S. Kouhnavardi, A. Roller, N. Gajic, **M. Pistis**, N. Singewald, J.J. Leban, V. Korz, J. Malikovic, R. Plasenzotti, H.H. Sitte, F.J. Monje, T. Langer, E. Urban, C. Pifl, and G. Lubec, *Reinstatement of synaptic plasticity in the aging brain through specific dopamine transporter inhibition.* **Mol Psychiatry**, 2021.

4. Pintori, N., M.P. Castelli, C. Miliano, N. Simola, P. Fadda, L. Fattore, M. Scherma, M.G. Ennas, R. Mostallino, G. Flore, M. De Felice, C. Sagheddu, **M. Pistis**, G. Di Chiara, and M.A. De Luca, *Repeated exposure to JWH-018 induces adaptive changes in the mesolimbic and mesocortical dopaminergic pathways, glial cells alterations, and behavioural correlates.* **Br J Pharmacol**, 2021. 178(17): p. 3476-3497.

5. Murru, E., G. Carta, C. Manca, V. Sogos, **M. Pistis**, M. Melis, and S. Banni, *Conjugated Linoleic Acid and Brain Metabolism: A Possible Anti-Neuroinflammatory Role Mediated by PPARalpha Activation.* **Front Pharmacol**, 2020. 11: p. 587140.

6. Sagheddu, C., L.H. Torres, T. Marcourakis, and **M. Pistis**, *Endocannabinoid-Like Lipid Neuromodulators in the Regulation of Dopamine Signaling: Relevance for Drug Addiction.* **Front Synaptic Neurosci**, 2020. 12: p. 588660. REVIEW

7. Torres, L.H., C.C. Real, W.M. Turato, L.W. Spelta, A.C.C. Dos Santos Durao, T.C. Andrioli, L. Pozzo, P.L. Squair, **M. Pistis**, D. de Paula Faria, and T. Marcourakis, *Environmental Tobacco Smoke During the Early Postnatal Period of Mice Interferes With Brain (18) F-FDG Uptake From Infancy to Early Adulthood - A Longitudinal Study.* **Front Neurosci**, 2020. 14: p. 5.

8. Sagheddu, C., N. Pintori, P. Kalaba, V. Dragacevic, G. Piras, J. Lubec, N. Simola, M.A. De Luca, G. Lubec, and **M. Pistis**, *Neurophysiological and Neurochemical Effects of the Putative Cognitive Enhancer (S)-CE-123 on Mesocorticolimbic Dopamine System.* **Biomolecules**, 2020. 10(5).

9. Devoto, P., C. Sagheddu, M. Santoni, G. Flore, P. Saba, **M. Pistis**, and G.L. Gessa, *Noradrenergic Source of Dopamine Assessed by Microdialysis in the Medial Prefrontal Cortex.* **Frontiers in Pharmacology**, 2020. 11(1530).

10. Secci, M.E., P. Mascia, C. Sagheddu, S. Beggiato, M. Melis, A.C. Borelli, M.C. Tomasini, L.V. Panlilio, C.W. Schindler, G. Tanda, S. Ferre, C.W. Bradberry, L. Ferraro, **M. Pistis**, S.R. Goldberg, R. Schwarcz, and Z. Justinova, *Astrocytic Mechanisms Involving Kynurenic Acid Control Delta(9)-Tetrahydrocannabinol-Induced Increases in Glutamate Release in Brain Reward-Processing Areas.* **Mol Neurobiol**, 2019. 56(5): p. 3563-3575.

12. Torres, L.H., N.T. Balestrin, L.E.W. Spelta, S.O. Duro, **M. Pistis**, and T. Marcourakis, *Exposure to tobacco smoke during the early postnatal period modifies receptors and enzymes of the endocannabinoid system in the brainstem and striatum in mice.* **Toxicol Lett**, 2019. 302: p. 35-41.

13. Sagheddu, C., M. Scherma, M. Congiu, P. Fadda, G. Carta, S. Banni, J.T. Wood, A. Makriyannis, M.S. Malamas, and **M. Pistis**, *Inhibition of N-acylethanolamine acid amidase reduces nicotine-induced dopamine activation and reward.* **Neuropharmacology**, 2019. 144: p. 327-336.

14. Rotolo, R.A., V. Dragacevic, P. Kalaba, E. Urban, M. Zehl, A. Roller, J. Wackerlig, T. Langer, **M. Pistis**, M.A. De Luca, F. Caria, R. Schwartz, R.E. Presby, J.H. Yang, S. Samels, M. Correa, G. Lubec, and J.D. Salamone, *The Novel Atypical Dopamine Uptake Inhibitor (S)-CE-123 Partially Reverses the Effort-Related Effects of the Dopamine Depleting Agent Tetrabenazine and Increases Progressive Ratio Responding.* **Front Pharmacol**, 2019. 10: p. 682.

15. Congiu, M., M. Trusel, **M. Pistis**, M. Mameli, and S. Lecca, *Opposite responses to aversive stimuli in lateral habenula neurons.* **Eur J Neurosci**, 2019.

16. De Felice, M., M. Melis, S. Aroni, A.L. Muntoni, S. Fanni, R. Frau, P. Devoto, and M. Pistis, *The PPARalpha agonist fenofibrate attenuates disruption of dopamine function in a maternal immune activation rat model of schizophrenia.* **CNS Neurosci Ther**, 2019. 25(5): p. 549-561.

17. Lecca, S., A. Luchicchi, M. Scherma, P. Fadda, A.L. Muntoni, and **M. Pistis**, *Δ9-Tetrahydrocannabinol During Adolescence Attenuates Disruption of Dopamine Function Induced in Rats by Maternal Immune Activation.* **Frontiers in Behavioral Neuroscience**, 2019. 13(202).

Responsabiledel Progetto Prof. ANDREA PERRA

Titoli dei progetti riguardanti la sperimentazione animale finanziati dal 2019 ad oggi

1. Finanziamento della fondazione AIRC (Fondazione dell'Associazione Italiana Ricerca sul Cancro)
Titolo: Targeting the T3/thyroid receptor axis: a new therapeutic opportunity for hepatocellular carcinoma?
Importo: euro 783.000
Termine rendicontazione: marzo 2023

2. Finanziamento Regione Autonoma della Sardegna (legge 7)
Titolo: Possibile utilizzo terapeutico dell'ormone tiroideo e dei suoi analoghi nel carcinoma epatocellulare
Importo: euro 110.000
Termine rendicontazione: dicembre 2021

Finanziamenti nei quali lo scrivente risulta responsabile di unità di ricerca
1. Finanziamento Fondazione di Sardegna (responsabile del progetto Fabio Marongiu)
Titolo: Regenerative medicine for the management of chronic liver disease
Importo: euro 83.992,14
Termine rendicontazione: dicembre 2021

Pubblicazioni con coinvolgimento CeSAst 2019-21:

1: Caddeo A, Kowalik MA, Serra M, Runfola M, Bacci A, Rapposelli S, Columbano A, **Perra A**. TG68, a Novel Thyroid Hormone Receptor-β Agonist for the Treatment of NAFLD**.** Int J Mol Sci. 2021 Dec 3;22(23):13105. doi: 10.3390/ijms222313105. PMID: 34884910; PMCID: PMC8657920.
2: Mattu S, Zavattari P, Kowalik MA, Serra M, Sulas P, Pal R, Puliga E, Sutti S, Foglia B, Parola M, Albano E, Giordano S, **Perra A**, Columbano A. Nrf2 mutation/activation is dispensable for the development of chemically-induced mouse HCC. Cell Mol Gastroenterol Hepatol. 2021 Sep 13:S2352-345X(21)00178-8. doi: 10.1016/j.jcmgh.2021.08.011. Epub ahead of print. PMID: 34530178.
3: Porcu S, Simbula M, Marongiu MF, **Perra A**, Poddie D, Perseu L, Kowalik MA, Littera R, Barella S, Caria CA, Demartis FR, Ristaldi MS. Delta-globin gene expression improves sickle cell disease in a humanised mouse model. Br J Haematol. 2021 Jun;193(6):1228-1237. doi: 10.1111/bjh.17561. Epub 2021 May 28. PMID: 34046885.
4: Serra M, Columbano A, **Perra A**, Kowalik MA. Animal Models: A Useful Tool to Unveil Metabolic Changes in Hepatocellular Carcinoma. Cancers (Basel). 2020 Nov 10;12(11):3318. doi: 10.3390/cancers12113318. PMID: 33182674; PMCID: PMC7696782.
5: Orrù C, Giordano S, Columbano A. Nrf2 in Neoplastic and Non-Neoplastic Liver Diseases. Cancers (Basel). 2020 Oct 12;12(10):2932. doi: 10.3390/cancers12102932. PMID: 33053665; PMCID: PMC7599585.

6: Orrù C, **Perra A**, Kowalik MA, Rizzolio S, Puliga E, Cabras L, Giordano S, Columbano A. Distinct Mechanisms Are Responsible for Nrf2-Keap1 Pathway Activation at Different Stages of Rat Hepatocarcinogenesis. Cancers (Basel). 2020 Aug 16;12(8):2305. doi: 10.3390/cancers12082305. PMID: 32824383; PMCID: PMC7463589.

7: Serra M, Columbano A, Ammarah U, Mazzone M, Menga A. Understanding Metal Dynamics Between Cancer Cells and Macrophages: Competition or Synergism? Front Oncol. 2020 Apr 30;10:646. doi: 10.3389/fonc.2020.00646. PMID: 32426284; PMCID: PMC7203474.

8: **Perra A**, Kowalik MA, Cabras L, Runfola M, Sestito S, Migliore C, Giordano S, Chiellini G, Rapposelli S, Columbano A. Potential role of two novel agonists of thyroid hormone receptor-β on liver regeneration. Cell Prolif. 2020 May;53(5):e12808. doi: 10.1111/cpr.12808. Epub 2020 Apr 29. Erratum in: Cell Prolif. 2021 Mar;54(3):e13006. PMID: 32347601; PMCID: PMC7260063.

9: Kowalik MA, Puliga E, Cabras L, Sulas P, Petrelli A, **Perra A**, Ledda-Columbano GM, Morandi A, Merlin S, Orrù C, Sanchez-Martin C, Fornari F, Gramantieri L, Parri M, Rasola A, Bellomo SE, Sebastian C, Follenzi A, Giordano S, Columbano A. Thyroid hormone inhibits hepatocellular carcinoma progression via induction of differentiation and metabolic reprogramming. J Hepatol. 2020 Jun;72(6):1159-1169. doi: 10.1016/j.jhep.2019.12.018. Epub 2020 Jan 15. PMID: 31954205.

10: Runfola M, Sestito S, Bellusci L, La Pietra V, D'Amore VM, Kowalik MA, Chiellini G, Gul S, **Perra A**, Columbano A, Marinelli L, Novellino E, Rapposelli S. Design, synthesis and biological evaluation of novel TRβ selective agonists sustained by ADME-toxicity analysis. Eur J Med Chem. 2020 Feb 15;188:112006. doi: 10.1016/j.ejmech.2019.112006. Epub 2019 Dec 23. PMID: 31931337.

11: Vega-Benedetti AF, Loi E, Moi L, Blois S, Fadda A, Antonelli M, Arcella A, Badiali M, Giangaspero F, Morra I, Columbano A, Restivo A, Zorcolo L, Gismondi V, Varesco L, Bellomo SE, Giordano S, Canale M, Casadei-Gardini A, Faloppi L, Puzzoni M, Scartozzi M, Ziranu P, Cabras G, Cocco P, Ennas MG, Satta G, Zucca M, Canzio D, Zavattari P. Clustered protocadherins methylation alterations in cancer. Clin Epigenetics. 2019 Jul 9;11(1):100. doi: 10.1186/s13148-019-0695-0. PMID: 31288858; PMCID: PMC6617643.

Responsabile del Progetto FABRIZIO SANNA

Titoli dei progetti riguardanti la sperimentazione animale finanziati dal 2019 ad oggi

"Neural plasticity induced by sexual experience: role of dopamine and oxytocin at the level of the mesolimbic system and of the hypothalamus". Host Institution: Università degli Studi di Cagliari, Dipartimento di Scienze Biomediche, Sezione di Neuroscienze e Farmacologia Clinica. Finanziamento triennale (2015-2018, prorogato 2019) erogato da: MIUR (Ministero dell'Istruzione, dell'Università e della Ricerca) a valere su Bando competitivo e con revisione fra pari SIR 2014, Scientific Independence of young Researchers. Progetto di ricerca di alta qualificazione nell'ambito di un programma di ricerca di rilevanza nazionale. Durata: 36+12 mesi (scaduto a settembre 2019). Importo: 310.510,00 Euro. Codice Progetto: RBSI14IUX7.

Pubblicazioni con coinvolgimento CeSAst 2019-21:

1. **SANNA F,** Bratzu J, Angioni L, Sorighe MP, Cocco C, Argiolas A, Melis MR (2021). Oxytocin-conjugated saporin injected into the substantia nigra of male rats alters the activity of the nigrostriatal dopaminergic system: A behavioral and neurochemical study. BRAIN RESEARCH, Vol 1773, 147705. ISSN 0006-8993, doi: 10.1016/j.brainres.2021.147705
2. Costa G, Caputi FF, Serra M, Simola N, Rullo L, Stamatakos S, **SANNA F**, Germain M, Martinoli M-G, Candeletti S, Morelli M and Romualdi P (2021). Activation of Antioxidant and Proteolytic Pathways in the Nigrostriatal Dopaminergic System After 3,4-Methylenedioxymethamphetamine Administration: Sex-Related Differences. FRONTIERS IN PHARMACOLOGY, 12:713486. ISSN: XXXX, doi: 10.3389/fphar.2021.713486
3. **SANNA F**, De Luca Maria Antonietta (2021). The potential role of oxytocin in addiction: What is the target process? CURRENT OPINION IN PHARMACOLOGY, vol. 58, p. 8-20, ISSN: 1471-4892, doi: 10.1016/j.coph.2021.03.002
4. **SANNA F**, Bratzu J, Serra MP, Leo D, Quartu M, Boi M, Espinoza S, Gainetdinov RR, Melis MR, Argiolas A (2020). Altered sexual behavior in dopamine transporter (DAT) knockout male rats: a behavioral, neurochemical and intracerebral microdialysis study. FRONTIERS IN BEHAVIORAL NEUROSCIENCE, 14:58, ISSN: 1662-5153, doi: 10.3389/fnbeh.2020.00058
5. Bharatiya R, Bratzu J, Lobina C, Corda G, Cocco C, De Deurwaerdere P, Argiolas A, Melis MR, **SANNA F** (2020). The pesticide fipronil injected into the substantia nigra of male rats decreases striatal dopamine content: A neurochemical, immunohistochemical and behavioral study. BEHAVIOURAL BRAIN RESEARCH, vol. 384, 112562, ISSN: 0166-4328, doi: 10.1016/j.bbr.2020.112562
6. Bratzu J, Bharatiya R, Manca E, Cocco C, Argiolas A, Melis MR, **SANNA F** (2019). Oxytocin induces penile erection and yawning when injected into the bed nucleus of the stria terminalis: A microdialysis and immunohistochemical study. BEHAVIOURAL BRAIN RESEARCH, vol. 375, 112147, ISSN: 0166-4328, doi: 10.1016/j.bbr.2019.112147

7. Melis MR, **SANNA F**, Argiolas A (2019). Rats selectively bred for showing divergent behavioral traits in response to stress or novelty or spontaneous yawning with a divergent frequency show similar changes in sexual behavior: the role of dopamine. REVIEWS IN THE NEUROSCIENCES, vol. 30(4), p. 427-454, ISSN: 2191-0200, doi: 10.1515/revneuro-2018-0058
8. **SANNA F**, Poddighe L, Serra MP, Boi M, Bratzu J, Sanna F, Corda MG, Giorgi O, Melis MR, Argiolas A, Quartu M (2019). c-Fos, ΔFosB, BDNF, trkB and Arc expression in the limbic system of male Roman High and Low Avoidance rats that show differences in sexual behaviour: effect of sexual activity. NEUROSCIENCE, vol. 396, p. 1-23, ISSN: 0306-4522, doi: 10.1016/j.neuroscience.2018.11.002

Responsabiledel Progetto ROBERTO FRAU
Pubblicazioni con coinvolgimento CeSAst 2019-21:

Frau R, Traccis F, Bortolato M. Neurobehavioural complications of sleep deprivation: Shedding light on the emerging role of neuroactive steroids. J Neuroendocrinol. 2020 Jan;32(1):e12792. doi: 10.1111/jne.12792. Epub 2019 Sep 30. PMID: 31505075; PMCID: PMC6982588.

Frau R, Bortolato M. Repurposing steroidogenesis inhibitors for the therapy of neuropsychiatric disorders: Promises and caveats. Neuropharmacology. 2019 Mar 15;147:55-65. doi: 10.1016/j.neuropharm.2018.05.013. Epub 2018 May 11. PMID: 29907425.

Godar SC, Mosher LJ, Scheggi S, Devoto P, Moench KM, Strathman HJ, Jones CM, **Frau R**, Melis M, Gambarana C, Wilkinson B, DeMontis MG, Fowler SC, Coba MP, Wellman CL, Shih JC, Bortolato M. Gene-environment interactions in antisocial behavior are mediated by early-life 5-HT_{2A} receptor activation. Neuropharmacology. 2019 Nov 15;159:107513. doi: 10.1016/j.neuropharm.2019.01.028. Epub 2019 Feb 1. PMID: 30716416; PMCID: PMC7578912.

Responsabili dei Progetti NICOLA SIMOLA – MICAELA MORELLI

Titoli dei progetti riguardanti la sperimentazione animale finanziati dal 2019 ad oggi

PRIN 2015: prot. 2015R9ASHT, titolo "Identification of molecular mechanisms linking neuroinflammation and mitochondrial dysfunction to the spreading of Parkinson's Disease: perspectives for an innovative therapeutic approach"
Finanziamento MIUR **€ 62500. Attività dal Febbraio 2017 a Febbraio 2020.**

PRIN 2017: prot. 2017LYTE9M, titolo " Molecular and imaging prodromal markers of dopamine neuron degeneration in animal models of Parkinson's disease: pathophysiology and clinical perspectives"
Finanziamento MIUR **€ 125399. Attività dal Settembre 2019 a Febbraio 2023.**

RAS 2016: prot: CRP_BRO2015_108; titolo: "Studio sperimentale tossicità cerebrale indotta dall'iperglicemia e valutazione possibile legame tra diabete mellito e neurodegenerazione dopaminergica".
Finanziamento**: € 75000. Attività da Aprile 2017 a Aprile 2019**

Fds 2017: Progetti di Ateneo; titolo: "Targeting neuroinflammation in psychiatric diseases: a multidisciplinary approach"
Finanziamento**: € 79100. Attività da Ottobre 2018 a Ottobre 2020**

Pubblicazioni con coinvolgimento CeSAst 2019-21:

Costa G, Pinna A, Porceddu PF, Casu MA, Di Maio A, Napolitano F, Usiello A, Morelli M. Rhes Counteracts Dopamine Neuron Degeneration and Neuroinflammation Depending on Gender and Age. Front Aging Neurosci. 2018 May 31;10:163. doi: 10.3389/fnagi.2018.00163. eCollection 2018.(Pubblicazione in rivista scientifica soggetta a revisione)

Sirabella R, Sisalli MJ, Costa G, Omura K, Ianniello G, Pinna A, Morelli M, Di Renzo GM, Annunziato L, Scorziello A. NCX1 and NCX3 as potential factors contributing to neurodegeneration and neuroinflammation in the A53T transgenic mouse model of Parkinson's Disease. Cell Death Dis. 2018 Jun 25;9(7):725. doi: 10.1038/s41419-018-0775-7. (Pubblicazione in rivista scientifica soggetta a revisione)

Costa G, Porceddu PF, Serra M, Casu MA, Schiano V, Napolitano F, Pinna A, Usiello A, Morelli M. Lack of Rhes Increases MDMA-Induced Neuroinflammation and Dopamine Neuron Degeneration: Role of Gender and Age. Int J Mol Sci. 2019 Mar 28;20(7). pii: E1556. doi: 10.3390/ijms20071556.(Pubblicazione in rivista scientifica soggetta a revisione)

Costa G, Sisalli MJ, Simola N, Della Notte S, Casu MA, Serra M, Pinna A, Feliciello A, Annunziato L, Scorziello A, Morelli M. Gender Differences in Neurodegeneration, Neuroinflammation and Na+-Ca2+Exchangers in the Female A53T Transgenic Mouse Model of Parkinson's Disease. Front Aging Neurosci. 2020; 12:118. doi: 10.3389/fnagi.2020.00118. Open Access GOLD CC-BY

Pinna A, Serra M, Marongiu J, Morelli M. Pharmacological interactions between adenosine A_{2A} receptor antagonists and different neurotransmitter systems. Parkinsonism Relat Disord. 2020 Nov;80 Suppl 1:S37-S44. doi: 10.1016/j.parkreldis.2020.10.023.

Serra M, Pinna A, Costa G, Usiello A, Pasqualetti M, Avallone L, Morelli M, Napolitano F. Involvement of the Protein Ras Homolog Enriched in the Striatum, Rhes, in Dopaminergic Neurons' Degeneration: Link to Parkinson's Disease. Int J Mol Sci. 2021 May 18;22(10):5326. doi: 10.3390/ijms22105326.

Scorziello A, Borzacchiello D, Sisalli MJ, Di Martino R, Morelli M, Feliciello A. Mitochondrial Homeostasis and Signaling in Parkinson's Disease. Front Aging Neurosci. 2020; 12:100. doi: 10.3389/fnagi.2020.00100. Open Access GOLD CC-BY

Nicola Simola, Annalisa Pinna, Lucia Frau, Giulia Costa, Jacopo Marongiu, Pathik Parekh, Marcello Serra, and Micaela Morelli. Book Chapter: Protective Agents in Parkinson's Disease: Caffeine and Adenosine A2A Receptor Antagonists. Handbook of Neurotoxicity, edited by Kostrzewa R.M. Ed. Springer, In-Press. 2021
Altre

Costa G, Caputi FF, Serra M, Simola N, Rullo L, Stamatakos S, Sanna F, Germain M, Martinoli MG, Candeletti S, Morelli M, Romualdi P. Activation of Antioxidant and Proteolytic Pathways in the Nigrostriatal Dopaminergic System After 3,4-Methylenedioxymethamphetamine Administration: Sex-Related Differences. Front Pharmacol. 2021 Aug 27;12:713486. doi: 10.3389/fphar.2021.713486. PMID: 34512343; PMCID: PMC8430399.

Costa G, Serra M, Simola N. Association between Novel Object Recognition/Spontaneous Alternation Behavior and Emission of Ultrasonic Vocalizations in Rats: Possible Relevance to the Study of Memory. Brain Sci. 2021 Aug 9;11(8):1053. doi: 10.3390/brainsci11081053. PMID: 34439672; PMCID: PMC8394680.

Zulu SS, Abboussi O, Simola N, Mabandla MV, Daniels WMU. Effects of combination antiretroviral drugs (cART) on hippocampal neuroplasticity in female mice. J Neurovirol. 2021 Apr;27(2):325-333. doi: 10.1007/s13365-021-00967-z. PMID: 33710598.

Serra M, Marongiu J, Simola N. Lack of drug- and cue-stimulated emissions of ultrasonic vocalizations in C57BL/6J mice repeatedly treated with amphetamine. Neurosci Lett. 2021 Apr 1;749:135733. doi: 10.1016/j.neulet.2021.135733. PMID: 33592304.

Costa G, Spulber S, Paci E, Casu MA, Ceccatelli S, Simola N, Morelli M. In utero exposure to dexamethasone causes a persistent and age-dependent exacerbation of the neurotoxic effects and glia activation induced by MDMA in dopaminergic brain regions of C57BL/6J mice. Neurotoxicology. 2021 Mar;83:1-13. doi: 10.1016/j.neuro.2020.12.005. PMID: 33338551.

Simola N, Serra M, Marongiu J, Costa G, Morelli M. Increased emissions of 50-kHz ultrasonic vocalizations in hemiparkinsonian rats repeatedly treated with dopaminomimetic drugs: A potential preclinical model for studying the affective properties of dopamine replacement therapy in Parkinson's disease. Prog Neuropsychopharmacol Biol Psychiatry. 2021 Jun 8;108:110184. doi: 10.1016/j.pnpbp.2020.110184. PMID: 33242502.

Costa G, Sisalli MJ, Simola N, Della Notte S, Casu MA, Serra M, Pinna A, Feliciello A, Annunziato L, Scorziello A, Morelli M. Gender Differences in Neurodegeneration, Neuroinflammation and Na^{+}-Ca^{2+} Exchangers in the Female A53T Transgenic Mouse Model of Parkinson's Disease. Front Aging Neurosci. 2020 May 7;12:118. doi: 10.3389/fnagi.2020.00118. PMID: 32477098; PMCID: PMC7232579.

Zulu SS, Abboussi O, Simola N, Mabandla MV, Daniels WMU. Anti-HIV drugs promote β-amyloid deposition and impair learning and memory in BALB/c mice. Acta Neuropsychiatr. 2020 Oct;32(5):257-264. doi: 10.1017/neu.2020.19. PMID: 32378496.

Sergi D, Renaud J, Simola N, Martinoli MG. Diabetes, a Contemporary Risk for Parkinson's Disease: Epidemiological and Cellular Evidences. Front Aging Neurosci. 2019 Nov 8;11:302. doi: 10.3389/fnagi.2019.00302. PMID: 31787891; PMCID: PMC6856011.

Costa G, De Luca MA, Piras G, Marongiu J, Fattore L, Simola N. Neuronal and peripheral damages induced by synthetic psychoactive substances: an update of recent findings from human and animal studies. Neural Regen Res. 2020 May;15(5):802-816. doi: 10.4103/1673-5374.268895. PMID: 31719240; PMCID: PMC6990793.

Costa G, Serra M, Marongiu J, Morelli M, Simola N. Influence of dopamine transmission in the medial prefrontal cortex and dorsal striatum on the emission of 50-kHz ultrasonic vocalizations in rats treated with amphetamine: Effects on drug-stimulated and conditioned calls. Prog Neuropsychopharmacol Biol Psychiatry. 2020 Mar 8;97:109797. doi: 10.1016/j.pnpbp.2019.109797. Epub 2019 Oct 25. PMID: 31669508.

Bruno A, Barresi E, Simola N, Da Pozzo E, Costa B, Novellino E, Da Settimo F, Martini C, Taliani S, Cosconati S. Unbinding of Translocator Protein 18 kDa (TSPO) Ligands: From in Vitro Residence Time to in Vivo Efficacy via in Silico Simulations. ACS Chem Neurosci. 2019 Aug 21;10(8):3805-3814. doi: 10.1021/acschemneuro.9b00300.

Renaud J, Simola N, Martinoli MG. The sweet road to Parkinson's disease. Aging (Albany NY). 2019 Feb 1;11(3):853-854. doi: 10.18632/aging.101806. PMID: 30708352; PMCID: PMC6382427.

Simola N, Granon S. Ultrasonic vocalizations as a tool in studying emotional states in rodent models of social behavior and brain disease. Neuropharmacology. 2019 Nov 15;159:107420. doi: 10.1016/j.neuropharm.2018.11.008.

Costa G, Serra M, Pintori N, Casu MA, Zanda MT, Murtas D, De Luca MA, Simola N, Fattore L. The novel psychoactive substance methoxetamine induces persistent behavioral abnormalities and neurotoxicity in rats. Neuropharmacology. 2019 Jan;144:219-232. doi: 10.1016/j.neuropharm.2018.10.031. PMID: 30366005.

Responsabile del Progetto De Luca, Maria Antonietta

Titoli dei progetti riguardanti la sperimentazione animale finanziati dal 2019 ad oggi

	Ruolo: Principal Investigator (Capo progetto)
Anno di finanziamento	
2018	Ente: Regione Autonoma della Sardegna. Titolo: Studio preclinico multidisciplinare sulle nuove sostanze psicoattive (Novel Psychoactive Substances, NPS) e valutazione dei loro effetti comportamentali e

	neurofisiologici in relazione all'età e al sesso. Importo: 110.000,00 € IN CORSO
	Ruolo: Co-Investigator (Capo Unità)
Anno di finanziamento	
2018	Ente: Dipartimento Politiche Antidroga, Titolo: Effetti delle NPS: Sviluppo di una multicentrica di ricerca per il potenziamento informativo del Sistema di Allerta Precoce PI: Dr. M. Marti (University of Ferrara). Durata: 12 mesi. Budget totale: 498.000,00 € IN CORSO
2018	Progetto Europeo JUSTSO (Analysis, knowledge dissemination, JUstice implementation and Special Testing of novel Synthetic Opioids) (http://justso-eu.eu/) PI: University of Cagliari, Italy (Prof. G. Di Chiara) Durata: 24 mesi. Budget totale: 610.835,00 € CONCLUSO

Pubblicazioni con coinvolgimento CeSAst 2019-21:

1) Bilel S, Tirri M, Arfè R, Stopponi S, Soverchia L, Ciccocioppo R, Frisoni P, Strano-Rossi S, Miliano C, De-Giorgio F, Serpelloni G, Fantinati A, **De Luca MA**, Neri M, Marti M. Pharmacological and Behavioral Effects of the Synthetic Cannabinoid AKB48 in Rats. Front Neurosci. 2019 Oct 30;13:1163. doi: 10.3389/fnins.2019.01163. PMID: 31736697; PMCID: PMC6831561.

2) Loi B, Sahai MA, **De Luca MA**, Shiref H, Opacka-Juffry J. The Role of Dopamine in the Stimulant Characteristics of Novel Psychoactive Substances (NPS)-Neurobiological and Computational Assessment Using the Case of Desoxypipradrol (2-DPMP). Front Pharmacol. 2020 Jun 5;11:806. doi: 10.3389/fphar.2020.00806. PMID: 32670057; PMCID: PMC7289955.

3) Costa G, Serra M, Pintori N, Casu MA, Zanda MT, Murtas D, **De Luca MA**, Simola N, Fattore L. The novel psychoactive substance methoxetamine induces persistent behavioral abnormalities and neurotoxicity in rats. Neuropharmacology. 2019 Jan;144:219-232. doi: 10.1016/j.neuropharm.2018.10.031. Epub 2018 Oct 23. PMID: 30366005.

4) Miliano C, Marti M, Pintori N, Castelli MP, Tirri M, Arfè R, **De Luca MA**. Neurochemical and Behavioral Profiling in Male and Female Rats of the Psychedelic Agent 25I-NBOMe. Front Pharmacol. 2019 Dec 12;10:1406. doi: 10.3389/fphar.2019.01406. PMID: 31915427; PMCID: PMC6921684.

5) Cannizzaro C, Talani G, Brancato A, Mulas G, Spiga S, **De Luca MA**, Sanna A, Marino RAM, Biggio G, Sanna E, Diana M. Dopamine Restores Limbic Memory Loss, Dendritic Spine Structure, and NMDAR-Dependent LTD in the Nucleus Accumbens of Alcohol-

Withdrawn Rats. J Neurosci. 2019 Jan 30;39(5):929-943. doi: 10.1523/JNEUROSCI.1377-18.2018. Epub 2018 Nov 16. PMID: 30446531; PMCID: PMC6382989.

6) Rotolo RA, Dragacevic V, Kalaba P, Urban E, Zehl M, Roller A, Wackerlig J, Langer T, Pistis M, **De Luca MA**, Caria F, Schwartz R, Presby RE, Yang JH, Samels S, Correa M, Lubec G, Salamone JD. The Novel Atypical Dopamine Uptake Inhibitor *(S)*-CE-123 Partially Reverses the Effort-Related Effects of the Dopamine Depleting Agent Tetrabenazine and Increases Progressive Ratio Responding. Front Pharmacol. 2019 Jun 28;10:682. doi: 10.3389/fphar.2019.00682. PMID: 31316379; PMCID: PMC6611521.

7) Costa G, **De Luca MA**, Piras G, Marongiu J, Fattore L, Simola N. Neuronal and peripheral damages induced by synthetic psychoactive substances: an update of recent findings from human and animal studies. Neural Regen Res. 2020 May;15(5):802-816. doi: 10.4103/1673-5374.268895. PMID: 31719240; PMCID: PMC6990793.

8) Sagheddu C, Pintori N, Kalaba P, Dragačević V, Piras G, Lubec J, Simola N, **De Luca MA**, Lubec G, Pistis M. Neurophysiological and Neurochemical Effects of the Putative Cognitive Enhancer (*S*)-CE-123 on Mesocorticolimbic Dopamine System. Biomolecules. 2020 May 18;10(5):779. doi: 10.3390/biom10050779. PMID: 32443397; PMCID: PMC7277835.

9) Musa A, Simola N, Piras G, Caria F, Onaivi ES, **De Luca MA**. Neurochemical and Behavioral Characterization after Acute and Repeated Exposure to Novel Synthetic Cannabinoid Agonist 5-MDMB-PICA. Brain Sci. 2020 Dec 18;10(12):1011. doi: 10.3390/brainsci10121011. PMID: 33353194; PMCID: PMC7766979.

10) Marti M, Talani G, Miliano C, Bilel S, Biggio F, Bratzu J, Diana M, **De Luca MA**, Fattore L. New insights into methoxetamine mechanisms of action: Focus on serotonergic 5-HT_2 receptors in pharmacological and behavioral effects in the rat. Exp Neurol. 2021 Nov;345:113836. doi: 10.1016/j.expneurol.2021.113836. Epub 2021 Aug 10. PMID: 34384790.

11) Leggio GM, Torrisi SA, Mastrogiacomo R, Mauro D, Chisari M, Devroye C, Scheggia D, Nigro M, Geraci F, Pintori N, Giurdanella G, Costa L, Bucolo C, Ferretti V, Sortino MA, Ciranna L, **De Luca MA**, Mereu M, Managò F, Salomone S, Drago F, Papaleo F. The epistatic interaction between the dopamine D3 receptor and dysbindin-1 modulates higher-order cognitive functions in mice and humans. Mol Psychiatry. 2021 Apr;26(4):1272-1285. doi: 10.1038/s41380-019-0511-4. Epub 2019 Sep 6. PMID: 31492942.

12) Pintori N, Castelli MP, Miliano C, Simola N, Fadda P, Fattore L, Scherma M, Ennas MG, Mostallino R, Flore G, De Felice M, Sagheddu C, Pistis M, Di Chiara G, **De Luca MA**. Repeated exposure to JWH-018 induces adaptive changes in the mesolimbic and mesocortical dopaminergic pathways, glial cells alterations, and behavioural correlates. Br J Pharmacol. 2021 Sep;178(17):3476-3497. doi: 10.1111/bph.15494. Epub 2021 Jun 29. PMID: 33837969; PMCID: PMC8457172.

Responsabile del Progetto Prof.ssa Carta Anna Rosa

Titoli dei progetti riguardanti la sperimentazione animale finanziati dal 2019 ad oggi

NIH - P.O. N. PO 75N95D20P00142 - 09/16/2020, EQUISITION/REFERENCE NO. 5810645 CARTA ANNAROSA -Evaluation of dithiopomalidomide in an animal model of Parkinson's disease L-DOPA induced dyskinesia
$ 24970

NIH - P.O. N. PO NIH - P.O. N. PO 75N95D20P00083 - 06/12/2020, EQUISITION/REFERENCE NO. 5679875 CARTA ANNAROSA - 09/16/2020, EQUISITION/REFERENCE NO. 5810645 CARTA ANNAROSA Evaluation of Pomalidomide in an animal model of Parkinson's disease L-DOPA induced dyskinesia
$ 24970

Pubblicazioni con coinvolgimento CeSAst 2019-21:

1. Jadzic D, Bassareo V, Carta AR, Carboni E. Nicotine, cocaine, amphetamine, morphine, and ethanol increase norepinephrine output in the bed nucleus of stria terminalis of freely moving rats. Addict Biol. 2021 Jan;26(1):e12864. doi: 10.1111/adb.12864.

2. Boi L, Pisanu A, Palmas MF, Fusco G, Carboni E, Casu MA, Satta V, Scherma M, Janda E, Mocci I, Mulas G, Ena A, Spiga S, Fadda P, De Simone A, Carta AR. Modeling Parkinson's Disease Neuropathology and Symptoms by Intranigral Inoculation of Preformed Human α-Synuclein Oligomers. Int J Mol Sci. 2020 Nov 12;21(22):8535. doi: 10.3390/ijms21228535.

3. Murgia F, Atzori L, Carboni E, Santoru ML, Hendren A, Pisanu A, Caboni P, Boi L, Fusco G, Carta AR. Metabolomics Fingerprint Induced by the Intranigral Inoculation of Exogenous Human Alpha-Synuclein Oligomers in a Rat Model of Parkinson's Disease. Int J Mol Sci. 2020 Sep 14;21(18):6745. doi: 10.3390/ijms21186745.

4. Jadzic D, Bassareo V, Carta AR, Carboni E. Nicotine, cocaine, amphetamine, morphine, and ethanol increase norepinephrine output in the bed nucleus of stria terminalis of freely moving rats. Addict Biol. 2019 Dec 17:e12864.

5. Cardia MC, Carta AR, Caboni P, Maccioni AM, Erbì S, Boi L, Meloni MC, Lai F, Sinico C. Trimethyl Chitosan Hydrogel Nanoparticles for Progesterone Delivery in Neurodegenerative Disorders. Pharmaceutics. 2019 Dec 6;11(12). pii: E657.

6. Di Benedetto G, Burgaletto C, Carta AR, Saccone S, Lempereur L, Mulas G, Loreto C, Bernardini R, Cantarella G. Beneficial effects of curtailing immune susceptibility in an

Alzheimer's disease model. J Neuroinflammation. 2019 Aug 13;16(1):166. doi: 10.1186/s12974-019-1554-9.

7. BOI L., PISANU A., GREIG N.H., SCERBA M.T., TWEEDIE D., MULAS G., FENU S., CARBONI E., SPIGA S., CARTA A.R. (2019). Immunomodulatory drugs alleviate l-dopa-induced dyskinesia in a rat model of Parkinson's disease. MOV DISORD. Jul 23. doi: 10.1002/mds.27799.

Responsabili dei Progetti Dott.ssa MARIA SCHERMA – Prof.ssa PAOLA FADDA

Fondi: Ministero dell'Istruzione, dell'Università edella Ricerca (PRIN 2010, Prot. N.U 2010BN3MXM_002), "RegioneAutonoma della Sardegna, Assessorato alla Programmazione" grants forbasic research (RICRAS_2012_FRATTA_01 - LR 7/2007 - BANDO2010 – FRATTA), Fondazione Banco di Sardegna (Prot. U627.2013/AI.551MGB).

Fondi: Ministero dell'Istruzione, dell'Università edella Ricerca (PRIN 2010, Prot. N.U 2010BN3MXM_002), "RegioneAutonoma della Sardegna, Assessorato alla Programmazione" grants forbasic research (RICRAS_2012_FRATTA_01 - LR 7/2007 - BANDO2010 – FRATTA), Fondazione Banco di Sardegna (Prot. U627.2013/AI.551MGB).

Pubblicazioni con coinvolgimento CeSAst 2019-21:

1. Collu R, Scherma M, Piscitelli F, Giunti E, Satta V, Castelli MP, Verde R, Fratta W, Bisogno T, Fadda P. Impaired brain endocannabinoid tone in the activity-based model of anorexia nervosa. Int J Eat Disord. 2019 Nov;52(11):1251-1262. doi: 10.1002/eat.23157;
2. D'Addario C, Zaplatic E, Giunti E, Pucci M, Micioni Di Bonaventura MV, Scherma M, Dainese E, Maccarrone M, Nilsson IA, Cifani C, Fadda P. Epigenetic regulation of the cannabinoid receptor CB1 in an activity-based rat model of anorexia nervosa. Int J Eat Disord. 2020 May;53(5):432-446. doi: 10.1002/eat.23271.
3. Scherma M, Qvist JS, Asok A, Huang SC, Masia P, Deidda M, Wei YB, Soni RK, Fratta W, Fadda P, Kandel ER, Kandel DB, Melas PA. Cannabinoid exposure in rat adolescence reprograms the initial behavioral, molecular, and epigenetic response to cocaine. Proc Natl Acad Sci U S A. 2020 May 5;117(18):9991-10002. doi: 10.1073/pnas.1920866117.

Responsabile del Progetto Prof. MANOLO CARTA

Titoli dei progetti riguardanti la sperimentazione animale finanziati dal 2019 ad oggi

2020 - Michael J Fox Foundation grant per il progetto "Pregnenolone for the treatment of L-DOPA-induced dyskinesia". Finanziamento: 92,000 000 $. Ruolo: PI

2021 – Finanziamento della Fondazione di Sardegna per il progetto "Targeting neurosteroids for neuroprotection in Parkinson's disease". Finanziamento totale 70,400 €. Ruolo: PI

Pubblicazioni con coinvolgimento CeSAst 2019-21:

1. Fanni, S., Scheggi, S., Rossi, F., ...Frau, R., Carta, M. 5alpha-reductase inhibitors dampen L-DOPA-induced dyskinesia via normalization of dopamine D1-receptor signaling pathway and D1-D3 receptor interaction. Neurobiology of Disease, 2019, 121, pp. 120–130
2. Cocco, C., Corda, G., Lisci, C., ...Bongioanni, P., Ferri, G.-L. VGF peptides as novel biomarkers in Parkinson's disease.. Cell and Tissue Research, 2020, 379(1), pp. 93–107
3. Scheggi, S., Rossi, F., Corsi, S., ...Björklund, A., Carta, M. BDNF Overexpression Increases Striatal D3Receptor Level at Striatal Neurons and Exacerbates D1-Receptor Agonist-Induced Dyskinesia.. Journal of Parkinson's Disease, 2020, 10(4), pp. 1503–1514
4. Carta, G., Murru, E., Vargiu, R., ...Banni, S., Stancampiano, R.. Essential fatty acids deficient diet modulates N-Acylethanolamide profile in rat's tissues. Prostaglandins Leukotrienes and Essential Fatty Acids, 2020, 153, 102053
5. Waters, S., Sonesson, C., Svensson, P., ...Hjorth, S., Waters, N. Preclinical pharmacology of [2-(3-fluoro-5-methanesulfonylphenoxy) ethyl](propyl)amine (IRL790), a novel dopamine transmission modulator for the treatment of motor and psychiatric complications in parkinson disease. Journal of Pharmacology and Experimental Therapeutics, 2020, 374(1), pp. 113–125

Titoli dei progetti riguardanti la sperimentazione animale finanziati dal 2012 ad oggi

Responsabile del Progetto Prof. ACQUAS ELIO

2012: **80K€** "Role of ERKs in the molecular mechanisms of tolerance and dependence to morphine" finanziato dalla Regione Autonoma della Sardegna L.R. 7/2007, CRP 26805 - Progetti di ricerca di base - Bando 2010.

2014: **10K€** "Ruolo dei Recettori GABA-B nel meccanismo dell'azione della Withania Somnifera sugli effetti dell'etanolo" prot. U910.2014/ AI.793MGB, Prat.2014.0165 finanziato dalla Fondazione Banco di Sardegna dal 01/01/2014 al 31/12/2017.

2018: **77K€** "Concomitant binge drinking of Alcoholic beverages and Energy drinks (Alcohol Mixed Energy Drinks: AMED) during adolescence: from an abnormal age-restricted behavior to a permanent behavioral impairment? A psychobehavioral,

neurochemical, and functional study in rats from adolescence to adulthood." Progetti biennali d'Ateneo Finanziati dalla Fondazione di Sardegna- annualità 2018

Pubblicazioni con coinvolgimento CeSAst 2019-21:

1: Maccioni R, Cottiglia F, Maccioni E, Talani G, Sanna E, Bassareo V, Kasture SB, Acquas E. The biologically active compound of *Withania somnifera* (L.) Dunal, docosanyl ferulate, is endowed with potent anxiolytic properties but devoid of typical benzodiazepine-like side effects. J Psychopharmacol. 2021, 35(10):1277-1284.

2: Bassareo V, Frau R, Maccioni R, Caboni P, Manis C, Peana AT, Migheli R, Porru S, Acquas E. Ethanol-Dependent Synthesis of Salsolinol in the Posterior Ventral Tegmental Area as Key Mechanism of Ethanol's Action on Mesolimbic Dopamine. Front Neurosci. 2021; 15:675061.

3: Porru S, López-Cruz L, Carratalá-Ros C, Salamone JD, Acquas E, Correa M. Impact of Caffeine on Ethanol-Induced Stimulation and Sensitization: Changes in ERK and DARPP-32 Phosphorylation in Nucleus Accumbens. Alcohol Clin Exp Res. 2021; 45(3):608-619.

4: Porru S, Maccioni R, Bassareo V, Peana AT, Salamone JD, Correa M, Acquas E. Effects of caffeine on ethanol-elicited place preference, place aversion and ERK phosphorylation in CD-1 mice. J Psychopharmacol. 2020; 34(12):1357-1370.

5: Peana AT, Bassareo V, Acquas E. Not Just from Ethanol. Tetrahydroisoquinolinic (TIQ) Derivatives: from Neurotoxicity to Neuroprotection. Neurotox Res. 2019; 36(4):653-668.

6: Rocchitta G, Peana AT, Bazzu G, Cossu A, Carta S, Arrigo P, Bacciu A, Migheli R, Farina D, Zinellu M, Acquas E, Serra PA. Simultaneous wireless and high-resolution detection of nucleus accumbens shell ethanol concentrations and free motion of rats upon voluntary ethanol intake. Alcohol. 2019; 78:69-78.

7: Bassareo V, Talani G, Frau R, Porru S, Rosas M, Kasture SB, Peana AT, Loi E, Sanna E, Acquas E. Inhibition of Morphine- and Ethanol-Mediated Stimulation of Mesolimbic Dopamine Neurons by *Withania somnifera*. Front Neurosci. 2019, 13:545.

8: Sonar VP, Fois B, Distinto S, Maccioni E, Meleddu R, Cottiglia F, Acquas E, Kasture S, Floris C, Colombo D, Sissi C, Sanna E, Talani G. Ferulic Acid Esters and Withanolides: In Search of Withania somnifera $GABA_A$ Receptor Modulators. J Nat Prod. 2019; 82(5):1250-1257.

9: Sabariego M, Rosas M, Piludu MA, Acquas E, Giorgi O, Corda MG. Active avoidance learning differentially activates ERK phosphorylation in the primary auditory and visual cortices of Roman high- and low-avoidance rats. Physiol Behav. 2019; 201:31-41.

10: Caputi FF, Rullo L, Acquas E, Ciccocioppo R, Candeletti S, Romualdi P.

Evidence of a PPARγ-mediated mechanism in the ability of Withania somnifera to attenuate tolerance to the antinociceptive effects of morphine. Pharmacol Res. 2019; 139:422-430.

Pubblicazioni (sperimentazione con metodi complementari)

1: Casu MA, Mocci I, Isola R, Pisanu A, Boi L, Mulas G, Greig NH, Setzu MD, Carta AR. Neuroprotection by the Immunomodulatory Drug Pomalidomide in the *Drosophila LRRK2*^{WD40} Genetic Model of Parkinson's Disease. Front Aging Neurosci. 2020 13;12:31.

2: Diana A, Collu M, Casu MA, Mocci I, Aguilar-Santelises M, Setzu MD.
Improvements of Motor Performances in the *Drosophila LRRK2* Loss-of-Function Model of Parkinson's Disease: Effects of Dialyzed Leucocyte Extracts from Human Serum. Brain Sci. 2020;10(1):45.

3: Corda G, Solari P, Dettori MA, Fabbri D, Delogu G, Crnjar R, Sollai G.
Association between olfactory sensitivity and behavioral responses of Drosophila suzukii to naturally occurring volatile compounds. Arch Insect Biochem Physiol. 2020;104(3):e21669.

4: Baroli B, Loi E, Solari P, Kasture A, Moi L, Muroni P, Kasture S, Setzu MD, Liscia A, Zavattari P. Evaluation of oxidative stress mechanisms and the effects of phytotherapic extracts on Parkinson's disease *Drosophila PINK1B9* model. FASEB J. 2019, 33(10):11028-11034.

5: Maccioni R, Setzu MD, Talani G, Solari P, Kasture A, Sucic S, Porru S, Muroni P, Sanna E, Kasture S, Acquas E, Liscia A. Standardized phytotherapic extracts rescue anomalous locomotion and electrophysiological responses of TDP-43 Drosophila melanogaster model of ALS. Sci Rep. 2018, 8(1):16002.

6: Solari P, Maccioni R, Marotta R, Catelani T, Debellis D, Baroli B, Peddio S, Muroni P, Kasture S, Solla P, Stoffolano JG Jr, Liscia A. The imbalance of serotonergic circuitry impairing the crop supercontractile muscle activity and the mitochondrial morphology of PD PINK1^{B9} Drosophila melanogaster are rescued by Mucuna pruriens. J Insect Physiol. 2018, 111:32-40.

7: De Rose F, Marotta R, Talani G, Catelani T, Solari P, Poddighe S, Borghero G, Marrosu F, Sanna E, Kasture S, Acquas E, Liscia A. Differential effects of phytotherapic preparations in the hSOD1 Drosophila melanogaster model of ALS. Sci Rep. 2017; 7:41059

Elenco delle attività che comportano la sperimentazione animale svolta negli stabulari CeSASt da parte di Istituti CNR.
Progetti di ricerca finanziati e/o pubblicazioni, triennio 2019-2021.

Istituto di Neuroscienze IN CNR, Sede di Cagliari

Responsabili di progetto: Giancarlo Colombo, Paola Maccioni

Titolo del progetto: Pharmacological characterization of the novel positive allosteric modulator of the $GABA_B$ receptor, COR659: focus on its "anti-alcohol" effects
Ente finanziatore: The European Foundation for Alcohol Research (ERAB), Bruxelles
Principal Investigator: **Paola Maccioni**
Periodo del finanziamento: 1/1/2018 – 20/4/2020
Finanziamento: 80.000,00 €

Titolo del progetto: Consumo di alcol, comportamenti alcol-correlati e trasmissione dopaminergica in ratti Sardinian alcohol-preferring esposti ad un ambiente arricchito "semi-naturalistico"
Ente finanziatore: Regione Autonoma della Sardegna
Principal Investigator: **Giancarlo Colombo**
Periodo del finanziamento: 18/3/2019 – 31/12/2021
Finanziamento: 110.000,00 €

Titolo del progetto: Sviluppo preclinico di alcuni nuovi prodotti con potenziale effetto terapeutico su sovrappeso e obesità, disturbi dell'alimentazione, diabete, sindromi metaboliche, dolore e ansia
Ente finanziatore: Indena S.p.A., Milano
Principal Investigator: **Giancarlo Colombo**
Periodo del finanziamento: 1/4/2019 – 31/12/2021
Finanziamento: 45.000,00 € (2019); 40.000,00 € (2020); 50.000,00 € (2021)

Titolo del progetto: The Korean medicinal herb, *Bupleurum falcatum*, and its active ingredients, saikosaponins: new remedies for the treatment of alcohol and food addiction?
Ente finanziatore: Consiglio Nazionale delle Ricerche (CNR), National Research Foundation of Korea (NRF)
Principal Investigator: **Giancarlo Colombo**
Periodo del finanziamento: 1/1/2020 – 31/12/2021
Finanziamento: 20.000,00 €

Pubblicazioni

1. **Maccioni P., Colombo G.,** Lorrai I., Fara F., Carai M.A.M., Gessa G.L., Brizzi A., Mugnaini C., Corelli F. Anti-addictive properties of COR659 – Additional pharmacological evidence and comparison with a series of novel analogues. Alcohol 75: 55-66, 2019.

2. **Maccioni P.**, Fara F., Lorrai I., Acciaro C., Mugnaini C., Corelli F., **Colombo G.** Suppressing effect of CMPPE, a new positive allosteric modulator of the $GABA_B$ receptor, on alcohol self-administration and reinstatement of alcohol seeking in rats. Alcohol 75: 79-87, 2019.

3. Rossetti I., Zambusi L., **Maccioni P.**, Sau R., Provini L., Castelli M.P., Gonciarz K., **Colombo G.**, Morara S. Predisposition to alcohol drinking and alcohol consumption alter expression of calcitonin gene-related peptide, neuropeptide Y, and microglia in bed nucleus of stria terminalis in a subnucleus-specific manner. Front. Cell. Neurosci. 13:158, doi: 10.3389/fncel.2019.00158, 2019.

4. Kalafateli A.L., Vallöf D., **Colombo G.**, Lorrai I., **Maccioni P.**, Jerlhag E. An amylin analogue attenuates alcohol-related behaviours in various animal models of alcohol use disorder. Neuropsychopharmacology 44(6): 1093-1102, 2019.

5. Lorrai I., Contini A., Gessa G.L., Mugnaini C., Corelli F., **Colombo G.**, **Maccioni P.** Operant, oral alcohol self-administration: Sex differences in Sardinian alcohol-preferring rats. Alcohol 79: 147-162, 2019.

6. Lobina C., Sau R., Fara F., **Maccioni P.**, Carai M.A.M., **Colombo G.** Analgesic properties of a food grade lecithin delivery system of *Zingiber officinale* and *Acmella oleracea* standardized extracts in rats. Nat. Prod. Res., doi: 10.1080/14786419.2019.1680667, 2019.

7. **Maccioni P.**, Lorrai I., Fara F., Carai M.A.M., Gessa G.L., Chin Y.-W., Lee J.H., Kwon H.C., Corelli F., **Colombo G.** Differential effects of saikosaponins A, B_2, B_4, C, and D on alcohol and chocolate self-administration in rats. Alcohol Alcohol. 55(4): 367-373, 2020.

8. Ferlenghi F., Maccioni P., Mugnaini C., Brizzi A., Fara F., Mostallino R., Castelli M.P., **Colombo G.**, Mor M., Vacondio F., Corelli F. The $GABA_B$ receptor positive allosteric modulator COR659: in vitro metabolism, in vivo pharmacokinetics in rats, synthesis and

pharmacological characterization of metabolically protected derivatives. Eur. J. Pharm. Sci. 155:105544, 2020.

9. Lobina C., **Maccioni P.**, Lorrai I., Zaru A., Collu M., Carai M.A.M., Brizzi A., Mugnaini C., Gessa G.L., Corelli F., **Colombo G.** Suppressing effect of the novel positive allosteric modulator of the $GABA_B$ receptor, COR659, on locomotor hyperactivity induced by different drugs of abuse. Behav. Brain Res. 400:113045, 2021.

10. **Maccioni P.**, Bratzu J., Carai M.A.M., **Colombo G.**, Gessa G.L. Reducing effect of cannabidiol on alcohol self-administration in Sardinian alcohol-preferring rats. Cannabis Cannabioid Res, in press, 2021.

11. Lanquetin A., Leclercq S., de Timary P., Segobin S., Naveau M., Coulbault L., **Maccioni P.**, Lorrai I., **Colombo G.**, Vivien D., Rubio M., Pitel A.-L. Role of inflammation in alcohol-related brain abnormalities: a translational study. Brain Commun. 3(3): fcab154, 2021.

12. Lobina C., Sau R., Fara F., Maccioni P., Carai M.A.M., Colombo G. Analgesic properties of a food grade lecithin delivery system of *Zingiber officinale* and *Acmella oleracea* standardized extracts in rats. *Natural Product Research* 35: 3078-3082, 2021. Autorizzazione ministeriale n. 622/2016-PR del 22/6/2016 e successiva integrazione del 22/2/2018

13. Maccioni P., Kaczanowska K., Lawrence H., Yun S., Bratzu J., Gessa G.L., McDonald P., Colombo G. The novel positive allosteric modulator of the $GABA_B$ receptor, KK-92A, suppresses alcohol self-administration and cue-induced reinstatement of alcohol seeking in rats. *Frontiers in Cell and Developmental Biology* 9: 727576, 2021. Autorizzazione ministeriale n. 342/2016-PR dell'1/4/2016 e successiva integrazione dell'1/4/2022

<u>Responsabile di progetto</u>: Dott.ssa Liana Fattore

Titolo progetto: "*Valutazione preclinica dei contraccettivi ormonali su incremento ponderale, comportamento alimentare e livelli plasmatici di leptina e grelina in adolescenza ed età adulta*".

PI: **Liana Fattore**

Ente Finanziatore: Fondazione di Sardegna (2020.1072)

Importo totale finanziamento: 10.000 (euro)

Periodo di attività: dal 1 Luglio 2020 al 30 Ottobre 2021 (in corso).

Titolo progetto: "*Methamphetamine Addiction Study*".

PI: **Liana Fattore**

Ente Finanziatore: Daya Drug Discoveries, Missouri (USA)

Importo totale finanziamento: 14.580 (euro)

Periodo di attività: dal 15 Luglio 2021 al 31 Dicembre 2021 (in corso).

Titolo progetto: "*Studio preclinico multidisciplinare sulle nuove sostanze psicoattive (Novel Psychoactive Substances, NPS) e valutazione dei loro effetti comportamentali e neurofisiologici in relazione all'età e al sesso".*

Ente Finanziatore: Regione Autonoma della Sardegna (RASSR03071)

PI: Unità Operativa CNR: **Liana Fattore**

Importo totale finanziamento: 110.000 (euro)

Importo finanziamento per Unità Operativa CNR: 36.000 (euro)

Periodo di attività: dal 18 Dicembre 2018 al 31 Dicembre 2021 (in corso).

Titolo progetto: "*Early life social experiences and dysregulation of the brain reward system: The role of endocannabinoid transmission".*

Ente Finanziatore: Ministero dell'Istruzione dell'Università e della Ricerca (PRIN: PROGETTI DI RICERCA DI RILEVANTE INTERESSE NAZIONALE – Bando 2017)

PI: Unità Operativa CNR: **Liana Fattore**

Importo totale finanziamento: 672.000 (euro)

Importo finanziamento per Unità Operativa CNR: 128.713 (euro)

Periodo di attività: dal 29 Agosto 2019 al 28 Febbraio 2023 (in corso).

Altri partner italiani o stranieri del progetto: Università di Camerino (UNICAM), Università di Bologna (UNIBO), Università di Milano (UNIMI), Università Roma 3 (UNIROMA3) .

Pubblicazioni

1. Marti M, Talani G, Miliano C, Bilel S, Biggio F, Diana M, De Luca MA, **Fattore L*** (2021). New insights into methoxetamine mechanisms of action: focus on serotonergic 5HT-2 receptors in pharmacological and behavioral effects in the rat. *Exp Neurol* 45, 113836.
2. Pintori N, Miliano C, Castelli MP, Simola N, Fadda P, **Fattore L**, Scherma M, Ennas MG, Flore G, De Felice M, Sagheddu C, Pistis M, Di Chiara G, De Luca MA (2021). Repeated exposure to JWH-018 induces adaptative changes in the mesolimbic and mesocortical dopamine pathways, glial cell alteration and behavioral correlates. *Br J Pharmacol.* 178, 3476-3497.
3. Franceschini A, **Fattore L** (2021). Gender-specific approach in psychiatric diseases: because sex matters. Eur J Neurosci, 896:173895.
4. Antonelli M, **Fattore L**, Sestito L, Di Giuda D, Diana M, Addolorato (2021). Transcranial Magnetic Stimulation: a review about its efficacy in the treatment of alcohol, tobacco and cocaine addiction. *Addict Behav* 114, 106760.

5. Scherma M, **Fattore L**, Fratta W, Fadda P (2021). Conditioned Place Preference (CPP) in Rats: From Conditioning to Reinstatement Test. *Methods Mol Biol.* 2201, 221-229.
6. **Fattore L**, Fadda P, Zanda MT, Fratta W (2021). Analysis of Opioid-Seeking Behavior Through the Intravenous Self-Administration Reinstatement Model in Rats. *Methods Mol Biol.* 2201, 231-245. doi: 10.1007/978-1-0716-0884-5_21.
7. Weinstein AM, **Fattore L** (2021). Editorial: Novel Psychoactive Drugs-The Saga Continues…. *Front Neurosci.* 15:650518.
8. Diana M, **Fattore** L (2020). Editorial: The Therapeutic Potential of Transcranial Magnetic Stimulation in Addiction. *Front Neurosci.* 14, 614642.
9. Sanna A, **Fattore L**, Badas P, Corona G, Diana M (2021). The hypodopaminergic state ten years after: Transcranial Magnetic Stimulation as a tool to test the dopamine hypothesis of drug addiction. *Curr Opin Pharmacol* 56, 61-67.
10. **Fattore L*,** Marti M, Mostallino R, Castelli MP (2020). Sex and Gender Differences in the Effects of Novel Psychoactive Substances. *Brain Sci* 10, 606.
11. Sanna F, Porcu P, **Fattore L** (2020). Editorial: Sexual Behavior as a Model for the Study of Motivational Drive and Related Behaviors. *Front Behav Neurosci.* 14, 121.
12. Costa G, De Luca MA, Piras G, Marongiu J, **Fattore L**, Simola N (2020). Neuronal and peripheral damages induced by synthetic psychoactive substances: an update of recent findings from human and animal studies. *Neural Regen Res* 15, 802-816.
13. Bilel S, Tirri M, Arfè R, Ossato A, Trapella C, Serpelloni G, Neri M, **Fattore L**, Marti M (2020). Novel halogenated synthetic cannabinoids impair sensorimotor functions in mice. *Neurotoxicology* 76, 17-32
14. **Fattore L***, Weinstein AM (2019). Editorial: Novel Psychoactive Drugs. *Front Psychiatry* 10, 119.
15. Sanna A, **Fattore L**, Badas P, Corona G, Cocco V, Diana M. (2019). Intermittent Theta Burst Stimulation of the Prefrontal Cortex in Cocaine Use Disorder: A Pilot Study. *Front Neurosci* 13, 765.
16. Diana M, Bolloni C, Antonelli M, Di Giuda D, Cocciolillo F, **Fattore L**, Addolorato G (2019). Repetitive Transcranial Magnetic Stimulation: re-wiring the alcoholic human brain. *Alcohol*, 74, 113-124.
17. Costa G, Serra M, Pintori N, Casu MA, Zanda MT, Murtas D, De Luca MA, Simola N, **Fattore L*** (2019). The novel psychoactive substance methoxetamine induces persistent behavioral abnormalities and neurotoxicity in rats. *Neuropharmacology,* 144, 219-232.

Responsabile di progetto: Dott.ssa Anna Lisa Muntoni

Titolo Progetto: "Circuiti neuronali dell'avversione e della gratificazione: focus su cannabis e oppiacei"

Ente Finanziatore: Fondazione di Sardegna, Progetto 2014.1992*

Ruolo: Principal Investigator / Responsabile Progetto: **Anna Lisa Muntoni**

Termine attività: 31 ottobre 2020 (*il finanziamento è stato concesso nel 2018, ovvero con un ritardo di 4 anni, per un disguido amministrativo dell'Ente finanziatore)

Finanziamento: Euro 10.000

Pubblicazioni:

1 Melis, M., **Muntoni, A.L.**, Pistis, M. (2021) Repurposing peroxisome proliferator-activated receptor agonists in neurological and psychiatric disorders. Pharmaceuticals 14(10), 1025.
2 Congiu, M., Micheli, L., Santoni, M., Sagheddu, C., **Muntoni, A.L.**, Makriyannis, A., Malamas, M.S., Ghelardini, C., Di Cesare Mannelli, L., Pistis, M (2021) N-Acylethanolamine Acid Amidase Inhibition Potentiates Morphine Analgesia and Delays the Development of Tolerance. Neurotherapeutics 18(4), pp. 2722-2736.
3 Congiu M, Micheli L, Santoni M, Sagheddu C, **Muntoni AL**, Makriyannis A, Malamas MS, Ghelardini C, Di Cesare Mannelli L, Pistis M. N-Acylethanolamine Acid Amidase Inhibition Potentiates Morphine Analgesia and Delays the Development of Tolerance. *Neurotherapeutics*. DOI: 10.1007/s13311-021-01116-4, 2021 (Online ahead of print) PMID: 34553321
4 Lecca S, Luchicchi A, Scherma M, Fadda P, **Muntoni AL,** Pistis M. Δ9-Tetrahydrocannabinol During Adolescence Attenuates Disruption of Dopamine Function Induced in Rats by Maternal Immune Activation. *Front Behav Neurosci.* 13:202, 2019. DOI: 10.3389/fnbeh.2019.00202. PMID: 31551729
5 De Felice M, Melis M, Aroni S, **Muntoni AL,** Fanni S, Frau R, Devoto P, Pistis M. The PPARα agonist fenofibrate attenuates disruption of dopamine function in a maternal immune activation rat model of schizophrenia. CNS Neurosci Ther. 25(5):549-561, 2019. DOI: 10.1111/cns.13087. PMID: 30461214

Responsabile di progetto: Dott.ssa Patrizia Porcu

Titolo Progetto: "Contraccettivi ormonali e interazione sociale: possibili fattori di rischio per l'insorgenza di depressione"

Ente Finanziatore: Fondazione di Sardegna, Progetto 2021.0504

Ruolo: Principal Investigator / Responsabile Progetto: **Patrizia Porcu**

Periodo di attività: 1 Maggio 2021 – 30 Aprile 2022

Finanziamento: Euro 10.000

Titolo Progetto: "Contraccettivi ormonali e abuso di cannabis: un possibile link?"

Ente Finanziatore: Fondazione di Sardegna, Progetto 2019.1440

Ruolo: Principal Investigator / Responsabile Progetto: **Patrizia Porcu**

Periodo di attività: 1 Aprile 2019 – 31 Dicembre 2020

Finanziamento: Euro 10.000

Pubblicazioni:

1. Sanna F, **Porcu P**, Fattore L. Editorial: Sexual behavior as a model for the study of motivational drive and related behaviors. *Front Behav Neurosci*, 14: 121, 2020. DOI:10.3389/fnbeh.2020.00121. PMID:33088263.

2. **Porcu P**, Serra M, Concas A. The brain as a target of hormonal contraceptives: evidence from animal studies. *Front Neuroendocrinol*, 55: 100799, 2019. DOI: 10.1016/j.yfrne.2019.100799. PMID: 31614151.

3. Pisu MG, Boero G, Garau A, Casula C, Cisci S, Biggio F, Concas A, Follesa P, Maciocco E, **Porcu P**, Serra M. Are preconceptional stressful experiences crucial elements for the aetiology of autism spectrum disorders? Insights from an animal model. *Neuropharmacology*, 157: 107686, 2019. DOI: 10.1016/j.neuropharm.2019.107686. PMID: 31247268.

Dott.ssa Annalisa Pinna

Pubblicazioni:

Costa G, Porceddu PF, Serra M, Casu MA, Schiano V, Napolitano F, **Pinna A**, Usiello A, Morelli M. Lack of Rhes Increases MDMA-Induced Neuroinflammation and Dopamine Neuron Degeneration: Role of Gender and Age. Int J Mol Sci. 2019 Mar 28;20(7). pii: E1556. doi: 10.3390/ijms20071556

Serra M, **Pinna A**, Costa G, Usiello A, Pasqualetti M, Avallone L, Morelli M, Napolitano F. Involvement of the Protein Ras Homolog Enriched in the Striatum, Rhes, in Dopaminergic Neurons' Degeneration: Link to Parkinson's Disease. Int J Mol Sci. 2021 May 18;22(10):5326. doi: 10.3390/ijms22105326.

Costa G, Sisalli MJ, Simola N, Della Notte S, Casu MA, Serra M, **Pinna A,** Feliciello A, Annunziato L, Scorziello A, Morelli M. Gender Differences in Neurodegeneration, Neuroinflammation and

Na+-Ca2+Exchangers in the Female A53T Transgenic Mouse Model of Parkinson's Disease. Front Aging Neurosci. 2020; 12:118. doi: 10.3389/fnagi.2020.00118.

Dott.ssa Mariapaola Mascia

Pubblicazioni

Synthesis of New $GABA_A$ Receptor Modulator with Pyrazolo[1,5-a]quinazoline (PQ) Scaffold. .Guerrini G, Vergelli C, Cantini N, Giovannoni MP, Daniele S, **Mascia MP**, Martini C, Crocetti L. Int J Mol Sci. 20(6):1438; 2019

Proximity frequencies' a new parameter to evaluate the profile of $GABA_AR$ modulators. Crocetti L, Guerrini G, Cantini N, Vergelli C, Melani F, **Mascia MP**, Giovannoni MP. Bioorg Med Chem Lett. 34:127755; 2021

Dott.ssa Maria Giuseppina Pisu

Pubblicazioni:

1 **M.G. Pisu,** G. Boero, A. Garau, C. Casula, S. Cisci, F. Biggio, A. Concas, P. Follesa, E. Maciocco, P. Porcu, M. Serra. Are preconceptional stressful experiences crucial elements for the aetiology of autism spectrum disorder? Insights from an animal model. Neuropharmacology 157, 2019. doi: 10.1016/j.neuropharm.2019.107686. Epub 2019 Jun 25.

2 M. Serra, F. Marongiu, **M.G. Pisu** , M. Serra, E. Laconi. Time-restricted feeding delays the emergence of the age-associated, neoplastic-prone tissue landscape. Aging (Albany NY). Jun 12;11(11):3851-3863, 2019.

Responsabile de progetto: Dott.ssa Cristina Cadoni

Pubblicazioni

Lecca D, Scifo A, Pisanu A, Valentini V, Piras G, Sil A, **Cadoni C**, Di Chiara G (2020). Adolescent cannabis exposure increases heroin reinforcement in rats genetically vulnerable to addiction. Neuropharmacology. 2020 Apr;166:107974. doi: 10.1016/j.neuropharm.2020.107974.

Cadoni C, De Felice M, Corongiu S, Dessì C, Espa E, Melis M, Fenu S (2020). Role of genetic background in the effects of adolescent nicotine exposure on mesolimbic dopamine transmission. Addict Biol. 2020 Sep;25(5):e12803. doi: 10.1111/adb.12803.

Corongiu S, Dessì C, **Cadoni C** (2020). Adolescence versus adulthood: Differences in basal mesolimbic and nigrostriatal dopamine transmission and response to drugs of abuse. Addict Biol. 2020 Jan;25(1):e12721. doi: 10.1111/adb.12721.

Dott.ssa Augusta Pisanu

Pubblicazioni

Modeling Parkinson's disease neuropathology and symptoms by intranigral inoculation of preformed human α-synuclein oligomers
Boi, L., **Pisanu, A**., Palmas, M.F., ...De Simone, A., Carta, A.R.

Adolescent cannabis exposure increases heroin reinforcement in rats genetically vulnerable to addiction
Lecca, D., Scifo, A., **Pisanu, A.,**…..Cadoni, C., Di Chiara, G.
Neuropharmacology, 2020, 166, 107974
Show abstract

Neuroprotection by the Immunomodulatory Drug Pomalidomide in the Drosophila LRRK2^{WD40} Genetic Model of Parkinson's Disease Casu, M.A., Mocci, I., Isola, R., ...Setzu, M.D., Carta, A.R. Frontiers in Aging Neuroscience, 2020, 12, 31

Metabolomics fingerprint induced by the intranigral inoculation of exogenous human alpha-synuclein oligomers in a rat model of parkinson's disease Murgia, F., Atzori, L., Carboni, E., ...Fusco, G., Carta, A.R. International Journal of Molecular Sciences, 2020, 21(18), pp. 1–18, 6745

Immunomodulatory drugs alleviate l-dopa-induced dyskinesia in a rat model of Parkinson's disease Boi, L., Pi**sanu, A**., Greig, N.H., ...Spiga, S., Carta, A.R. Movement Disorders, 2019, 34(12), pp. 1818–1830

Dott. Giuseppe Talani
Pubblicazioni

1. Marti M, Talani G, Miliano C, Bilel S, Biggio F, Bratzu J, Diana M, De Luca MA, Fattore L. New insights into methoxetamine mechanisms of action: Focus on serotonergic 5-HT2 receptors in pharmacological and behavioral effects in the rat. Exp Neurol. 2021 Nov;345:113836.

2. Maccioni R, Cottiglia F, Maccioni E, Talani G, Sanna E, Bassareo V, Kasture SB, Acquas E. The biologically active compound of Withania somnifera (L.) Dunal, docosanyl ferulate, is endowed with potent anxiolytic properties but devoid of typical benzodiazepine-like side effects. J Psychopharmacol. 2021 May 3:2698811211008588.

3. Talani G, Biggio F, Mostallino MC, Locci V, Porcedda C, Boi L, Saolini E, Piras R, Sanna E, Biggio G. Treatment with gut bifidobacteria improves hippocampal plasticity and cognitive behavior in adult healthy rats. Neuropharmacology. 2020 Mar 15;165:107909.

4. Bassareo V, Talani G, Frau R, Porru S, Rosas M, Kasture SB, Peana AT, Loi E, Sanna E, Acquas E. Inhibition of Morphine- and Ethanol-Mediated Stimulation of Mesolimbic Dopamine Neurons by Withania somnifera. Front Neurosci. 2019 Jun 4;13:545.

5. Sonar VP, Fois B, Distinto S, Maccioni E, Meleddu R, Cottiglia F, Acquas E, Kasture S, Floris C, Colombo D, Sissi C, Sanna E, Talani G.
Ferulic Acid Esters and Withanolides: In Search of Withania somnifera $GABA_A$ Receptor Modulators. J Nat Prod. 2019 May 24;82(5):1250-1257.

6. Biggio F, Mostallino MC, Talani G, Locci V, Mostallino R, Calandra G, Sanna E, Biggio G. Social enrichment reverses the isolation-induced deficits of neuronal plasticity in the hippocampus of male rats. Neuropharmacology. 2019 Jun;151:45-54.

7. Cannizzaro C, Talani G, Brancato A, Mulas G, Spiga S, De Luca MA, Sanna A, Marino RAM, Biggio G, Sanna E, Diana M. Dopamine Restores Limbic Memory Loss, Dendritic Spine Structure, and NMDAR-Dependent LTD in the Nucleus Accumbens of Alcohol-Withdrawn Rats. J Neurosci. 2019 Jan 30;39(5):929-943.

Istituto di Ricerca Genetica e Biomedica IRGB CNR, sede di Cagliari

Responsabili di progetto: Maria Serafina Ristaldi, Manuela Uda

Titolo del Progetto:	The human δ-globin gene as a therapeutic tool for β hemoglobinopathies. post GWAS target validation and evaluation of molecules in preclinical models.
PI:	**Maria Serafina Ristaldi**
Ente finanziatore:	Fondazione Telethon. Grant n.GGP20046
Annualità:	2019-2023
Importo	237.000,00 euro

Titolo del Progetto:	Identification and validation of functionally relevant non-coding RNAs in hemoglobin switching, as potential therapeutic targets for the treatment of ß-thalassemia.
PI:	Paolo Moi, Dipartimento Scienze Mediche e Sanità Pubblica
PI Unità 2 CNR:	**Manuela Uda**
Ente finanziatore:	Ministero della Salute. Bando Ricerca Finalizzata 2019, Grant n. RF-2019-12369259
Annualità:	2019-2022
Importo	115.500,00 euro

Titolo del Progetto:	Caratterizzazione funzionale di un long non coding RNA al locus BCL11A umano e di miRNAs al locus ortologo murino, come potenziali bersagli terapeutici per il trattamento della beta-talassemia
PI:	**Manuela Uda**
Ente finanziatore:	Associazione Thalassa Azione Onlus
Annualità:	2021
Importo	10.000,00

Pubblicazioni

1. Porcu S, Simbula M, Marongiu MF, Perra A, Poddie D, Perseu L, Kowalik MA, Littera R, Barella S, Caria CA, Demartis FR, **Ristaldi MS**. Delta-globin gene expression improves sickle cell disease in a humanised mouse model. British Journal of Haematology. 2021 May 28. doi: 10.1111/bjh.17561

2. Manchinu MF, Simbula M, Caria CA, Musu E, Perseu L, Porcu S, Steri M, Poddie D, Frau J, Cocco E, Manunza L, Barella S, **Ristaldi MS**. Delta-globin gene expression is enhanced in vivo by Interferon Type I. Front Med (Lausanne). 2020 May 22;7:163.doi:10.3389/fmed.2020.00163. eCollection 2020. PMID: 32528964

Pubblicazioni (sperimentazione con metodi complementari)

1: Casu MA, Mocci I, Isola R, Pisanu A, Boi L, Mulas G, Greig NH, Setzu MD, Carta AR. Neuroprotection by the Immunomodulatory Drug Pomalidomide in the *Drosophila LRRK2*^{WD40} Genetic Model of Parkinson's Disease. Front Aging Neurosci. 2020 13;12:31.

2: Diana A, Collu M, Casu MA, Mocci I, Aguilar-Santelises M, Setzu MD.
Improvements of Motor Performances in the *Drosophila LRRK2* Loss-of-Function Model of Parkinson's Disease: Effects of Dialyzed Leucocyte Extracts from Human Serum. Brain Sci. 2020;10(1):45.

3: Corda G, Solari P, Dettori MA, Fabbri D, Delogu G, Crnjar R, Sollai G.
Association between olfactory sensitivity and behavioral responses of Drosophila suzukii to naturally occurring volatile compounds. Arch Insect Biochem Physiol. 2020;104(3):e21669.

4: Baroli B, Loi E, Solari P, Kasture A, Moi L, Muroni P, Kasture S, Setzu MD, Liscia A, Zavattari P. Evaluation of oxidative stress mechanisms and the effects of phytotherapic extracts on Parkinson's disease *Drosophila PINK1B9* model. FASEB J. 2019, 33(10):11028-11034.

5: Maccioni R, Setzu MD, Talani G, Solari P, Kasture A, Sucic S, Porru S, Muroni P, Sanna E, Kasture S, Acquas E, Liscia A. Standardized phytotherapic extracts rescue anomalous locomotion and electrophysiological responses of TDP-43 Drosophila melanogaster model of ALS. Sci Rep. 2018, 8(1):16002.

6: Solari P, Maccioni R, Marotta R, Catelani T, Debellis D, Baroli B, Peddio S, Muroni P, Kasture S, Solla P, Stoffolano JG Jr, Liscia A. The imbalance of serotonergic circuitry impairing the crop supercontractile muscle activity and the mitochondrial morphology of PD PINK1^{B9} Drosophila melanogaster are rescued by Mucuna pruriens. J Insect Physiol. 2018, 111:32-40.

7: De Rose F, Marotta R, Talani G, Catelani T, Solari P, Poddighe S, Borghero G, Marrosu F, Sanna E, Kasture S, Acquas E, Liscia A. Differential effects of phytotherapic preparations in the hSOD1 Drosophila melanogaster model of ALS. Sci Rep. 2017; 7:41059

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