

Università degli Studi di Siena
Dottorato di Ricerca in Medicina Molecolare

Scheda Relazione Annuale Dottorando
(da redigere in lingua inglese)

Siena, 06/10/2024

Al Collegio Docenti del Dottorato in Medicina Molecolare

dr.ssa **Sara Salviati**

ciclo **XXXVIII** tutor **Carla Gambarana**

Attività scientifica svolta nel 2° anno di Dottorato, Anno Accademico **2023/2024**

- **Introduction:**

Social deficits are the core symptoms of autism spectrum disorder (ASD). Brain regions that control social motivation and reward responses (e.g., prefrontal cortex, PFC, and nucleus accumbens, NAc) are involved in development of behavioral deficits likely due to disruption in dopamine pathways. In addition, the endocannabinoid system (ECS) plays a role in mediating reward responses, particularly to social cues, in part via modulation of dopamine release. In the first year of my PhD, I began the study of the hypomorphic MAOANeo mice as a model of ASD-like social deficits using the 3-chamber sociability test. Male MAOANeo mice spent less time in the social compartment. The assessment of sociability based on preference for a compartment may not accurately represent propensity to social interaction. In order to confirm these findings, I set up and performed additional behavioral assays in mice of different ages. Moreover, I investigated the role of ECS by analyzing the expression levels of ECS markers in the PFC and NAc in neonates and adult mice.

- **Methods:**

We bred heterozygous MAOANeo females and wild-type males (WT) to obtain litters with mice of different genotypes. Only male mice from at least 4 litters were used in my experiments. At weaning, mice were genotyped and grouped by genotype (WT or hemizygous). Behavioral assessments were performed at early and late adolescence (PND28 and PND56). To analyze by immunoblotting the levels of ECS markers (CB1R, FAAH and NAPE-PLD), mice were sacrificed at PND7 and PND56.

- **Results:**

Behavioral experiments showed that MAOANeo mice exhibited decreased social interactions and increased perseverative behaviors compared to WT littermates, thus confirming the validity of the ASD model. Immunoblotting analyses indicated a developmental delay in the ECS maturation, with low FAAH expression in the PFC at PND7. In adult MAOANeo mice, impairment in ECS transmission in the PFC is suggested by the higher FAAH expression levels.

Soft skills:

- “Lavoro editoriale per l'editoria scolastica e universitaria (scienze e lettere)” – Dr. Alessandro Mongatti, Santa Chiara Lab, SOFT SKILL 1 CFU, 20/06/2024
- “Un progetto di convergenza delle case editrici (Mondadori, De' Agostini e Rizzoli) riguardo all'approccio e alle soluzioni digitali per la didattica, con sviluppo e applicazione di IA” - Dott. Bagarotto, Santa Chiara Lab, SOFT SKILL 0.5 CFU, 21/06/2024
- “Rischi naturali: Conoscere, prevenire, difendersi” – Università degli studi di Firenze, SOFT SKILL 0.5 CFU, 28/06/2024
- “Science and Society: continuity and change” - Dr.ssa Agnes Allansdottir, Santa Chiara Lab, SOFT SKILLS, 1 CFU, 17/09/2024
- “The role of standardization in innovation development” – Prof. Carlo Carobbi e Gianluca Murgia, Santa Chiara Lab, SOFT SKILLS, 1 CFU, 24/09/2024
- “Come la terapia genica sta cambiando la storia di malattie ereditarie e tumorali” - Prof. Franco Locatelli, Presidio Le Scotte, SOFT SKILLS, 0.5 CFU, 27/09/2024

Seminars for PhD course lessons:

- “Dual filaments regulation of muscle contraction” - Prof. M. Linari, 23/02/2024 (Firenze)
- “The molecular motor of muscle studied in vitro mechanics” - Prof. P. Bianco, 23/02/2024 (Firenze)
- “Mechanical dysfunction in genetic-based cardiomyopathies: perspectives for the use of novel small molecules and biomimetic polymers” - Prof.ssa C. Ferrantini - Prof.ssa N. Piroddi, 23/02/2024 (Firenze)
- “High-throughput sequencing: technologies and application in molecular medicine” - Prof.ssa Betti Giusti, 23/02/2024 (Firenze)
- “Effects of SGLT-2 inhibitors in diseased myocardium” - Prof.ssa E. Cerbai - Prof. R. Coppini, 23/02/2024 (Firenze)
- “The beta-adrenergic system in the retina: targeting beta adrenoceptors against retinal neovascular diseases” - Prof. M. Dal Monte – Dr. R. Amato, 11/04/2024 (Pisa)
- “Beyond the proteome: non-coding regulatory RNAs in cell pathophysiology” – Prof. S. Cagnin, Univ. di Padova, 20-21/05/2024 (Siena)

Other courses:

- Corso di formazione in materia di “PROTEZIONE DEGLI ANIMALI UTILIZZATI A FINI SCIENTIFICI” – parte pratica, 23/11/2023 – 19/04/2024
- “Diversity and specialization of skeletal muscle fibers: an omics point of view” – Seminario, Prof. Caro Reggiani, Siena, 15/04/2024
- “Circular RNA: the salt of the transcriptome” – Seminario, Prof.ssa Geertruij te Kronnie, Siena, 15/04/2024
- “Progettare soluzioni nel settore salute” – 1° sessione corso THRUST 2024, Webinar, Prof. Andrea Bonaccorsi, Università di Pisa - 15/05/24
- “Definire la proposta di valore” - 2° sessione corso THRUST 2024, Webinar, Dr.ssa Clarissa Ceruti, Bugnion Spa, 23/05/24
- “Definire il business model e il piano di marketing” - 3° sessione corso THRUST 2024, Webinar, Dr.ssa Clarissa Ceruti, Bugnion Spa, 28/05/24
- Esame finale Dottorato in Medicina molecolare XXXVI ciclo – Siena, 30/05/2024
- “Pianificazione e gestione economico-finanziaria di una startup” - 4° sessione corso THRUST 2024, Webinar, Dr. Marcello Marzano, Studio MM, 06/06/24
- “Pitch e storytelling” - 5° sessione corso THRUST 2024, Webinar, Ing. Giuseppe Arturo, StartLab Service, 13/06/24
- “Cenni su aspetti regolatori del settore (farma, dispositivi medici, digital health, nutraceutica) e sulle sperimentazioni cliniche e pre-cliniche” – 6° sessione corso THRUST 2024, Webinar, Dr.ssa Raffaella Pandini, dr.ssa Patrizia Pecin, Pharma D&S, 19/06/24
- “Cenni di proprietà intellettuale e processi di valorizzazione dei risultati di ricerca nelle scienze della vita” – 8° sessione corso THRUST 2024, Webinar, Dr. Andrea Frosini, Fondazione Toscana Life Sciences, 03/07/24

- “Aspetti legali su costituzione startup, rapporto con investitori e enti pubblici di ricerca” – 7° sessione corso THRUST 2024, Webinar, Avv. Marco Gardino, RP Legal & Tax, 11/07/24

Abroad laboratory experiences:

- Department of Pharmacology and Toxicology, University of Utah, Salt Lake City, USA (22/07/2024 – 21/08/2024)