

Al collegio docenti del Dottorato in Medicina Molecolare

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- Introduction

There are no available effective treatments for autism spectrum disorder (ASD) social deficits. Mesocorticolimbic brain regions that control social motivation and reward (e.g., prefrontal cortex, PFC, and nucleus accumbens, NAC) are likely involved in the development of ASD-related behavioral impairments. In a rat model of ASD induced by prenatal exposure to valproic acid, prior studies have demonstrated that administration of fenofibrate (FBR), a PPAR- α agonist, reduces social deficits and repetitive behaviors and restores the mesolimbic dopamine response to social interaction. In this project, using a genetic mouse model I aimed to confirm the hypomorphic MAO-A Neo mice as a model of ASD-like social deficits and to further investigate the role of the PPAR- α system, assessing in this model the potential therapeutic efficacy of the PPAR- α agonist FBR.

- Methods

The MAO-A Neo mice were generated from wild type 129 mice by insertion of a floxed neomycin-resistance cassette in intron-12 of the Maa gene. We acquired and bred heterozygous MAO-A Neo females and wild-type males (WT) to obtain litters with female and male mice of different genotypes. I used only male mice. After weaning, mice were genotyped and divided in 4 groups based on genotype (wt or hemizygous) and on whether they received a standard diet or a FBR-enriched diet. After 4 weeks, mice were tested with the Three-chamber sociability test to confirm the expression of an ASD phenotype in the MAO-A Neo mice and evaluate the effect of FBR administration on social deficits. Mice were then sacrificed to measure by immunoblotting the expression levels of PPAR- α in the brain areas of interest, PFC and NAc.

- Results

Behavioral test showed deficits in social behaviors in mutated mice compared to WT littermates. FBR treatment improved social interactions in MAO-A Neo mice. Immunoblotting analyses showed that PPAR- α expression levels were increased in FBR-treated WT and MAO-NEO groups in the PFC only.

Abstracts and courses:

- Corso di formazione online “**Elementi base per l’approccio dei ricercatori all’utilizzo degli animali ai fini scientifici**”. Istituto Zooprofilattico Sperimentale della Lombardia e dell’Emilia Romagna, 30/11/2022
- **PhD day** 17/01/2023 (Firenze)
- “**How to study genetics in complex diseases**” Prof. Stefano Landi, 19/01/2023 e 26/01/2023 (Pisa)
- “**Microvesicles in cell-to-cell communication**” Dr.ssa Laura Governini, 27/02/2023 (Siena)

- **“Biomarkers discovery in precision medicine”** Dr.ssa Alice Luddi, 27/02/2023 (Siena)
- **“Through thick and thin...and titin: Defining titin's role to muscle function”** Prof. Anthony Hessel 04/04/2023 (Firenze)
- **“Advanced optical methods to monitor and control the cardiac electrical activity”** Prof. Leonardo Sacconi 04/04/2023 (Firenze)
- **“Cellular mechanisms of heart failure”** Prof. Pieter de Tombe 04/04/2023 (Firenze)
- **“Drug development, sex-dependent difference, pharmacovigilance”** Prof. Elisabetta Cerbai e Elisabetta Bigagli 04/04/2023 (Firenze)
- **PhD Final exam 35° ciclo** 17/05/2023 (Siena)
- **“I finanziamenti europei nel settore digitale”** 11/05/2023 (Santa Chiara Lab)
- **“Europrogettazione: programmi, progetti e rendicontazione”** 18/05/2023 (Santa Chiara Lab)
- **“How to publish in high impact journals - Life and Medical Sciences”** Elsevier webinar 22/05/2023
- **“Outside-the-box Generation of Targeted Mutant Rodent Models”** Charles River webinar 24/05/2023
- **“Science and Society: continuity and change”** 29/05/2023 (Santa Chiara Lab)
- **“Effetto del paclitaxel sul tessuto cutaneo nei pazienti oncologici e nelle colture cutanee 3D e sua implicazione nell'attivazione del TLR4”** Dr. Martín Pérez Leal 30/05/2023 (Siena)
- **“PhD and then? Overview on career paths inside and outside the academia”** 12/06/2023 (Santa Chiara Lab)
- **“Last update in Sustainability reporting regulation”** 07/09/2023 (Santa Chiara Lab)
- **“The role of standardization in innovation development”** 20/09/2023 (Santa Chiara Lab)
- **“How to exploit your research idea: a quick introduction to EU project design and management”** 27/09/2023 (Santa Chiara Lab)
- Corso di formazione in materia di **“PROTEZIONE DEGLI ANIMALI UTILIZZATI A FINI SCIENTIFICI”** 05/06/2023 – 23/06/2023

Abroad laboratory experiences:

- Department of Pharmacology and Toxicology, University of Utah, Salt Lake City, USA (22/07/2023 - 28/08/2023)