Section of Pharmacology

Faculty members

Maria Angela SORTINO
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Associate Professor

Gian Marco LEGGIO
Assistant Professor

Vincenzo MICALE
Assistant Professor

Manuela PENNISI
Assistant Professor

Gianluca ROMANO
Assistant Professor
Section of Pharmacology

RESEARCH LINES

Pharmacology of neurodegenerative diseases
- Neural Stem Cell (NSC) transplantation and astrocyte-derived exosome therapies in PD
- Targeting LRRK2 mutations, neuroinflammation and aging in PD
- The role of astrocytes in BBB function in AD
- Microglia-neuron crosstalk in AD
- Neuronal mechanisms linked to GPCR in health and disease
- Neuroinflammation in neurodegenerative disorders: molecular targets and new drugs

Neuropsychopharmacology
- Study of the dopamine D3 receptor-mediated signaling in the pathophysiology of schizophrenia, substance use disorders and mood disorders
- Role of the endogenous cannabinoid system in health and disease

Rehabilitation Medicine
- Performance measures in individuals with unilateral lower-limb amputation.
- Training with Functional Electrical Stimulation on persons with spinal cord lesion.

Vascular Pharmacology
- In vitro study of isolated vessels;
- regulation of vascular tone;
- study of vasoactive compounds;
- study of endothelial function and dysfunction.

Clinical Pharmacology
- Efficacy and safety of drugs in CNS disorders: multicenter studies
- Appropriate prescription of medical devices in hospital setting

Ocular Pharmacology
- Ocular pharmacology and drug delivery
- Retinal degenerative diseases including diabetic retinopathy, age-related macular degeneration and glaucoma
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INTERNATIONAL COLLABORATION

- S. Pluchino, L. Peruzzotti-Jametti, University of Cambridge, UK
- D. Belin, University of Cambridge, UK
- M. Deleidi, T. Gasser, University of Tübingen, Germany
- J.M. Garcia Verdugo, University of Valencia, Spain
- C.T. Wotjak, Max-Plank Institute of Psychiatry, Munich, Germany.
- A. Sulcova, CEITEC/Masaryk University, Brno, Czech Republic
- Institut Monder Recherche Biomédicale INSERM U955, Univ. Paris-Est, Créteil, France
- I. Katona, Hungarian Academy of Sciences (MTA), Hungary
- Dept. Cancer Biology, UCL Cancer Institute, London UK
- Dept. Pharmaceutical Sciences, the Hebrew University, Jerusalem, Israel
- Dept Neurobiology, Tel Aviv University, Tel Aviv, Israel
- Dept. Biomolecular Sciences, The Weizmann Institute of Sciences, Rehovot, Israel
- S.J. Mennerick, Washington University in St Louis, St Louis, MO, USA
- C.F. Zorumski, Washington University in St Louis, St Louis, MO, USA
- Bascom Palmer Eye Institute, University of Miami Health System, Miami, FL, USA
- Moss Rehab Hospital, Philadelphia, PA, USA
- Eye Research Institute, Oakland University, Rochester, MI, USA
- Department of Neuroscience, Maimonides University, Buenos Aires, Argentina
- National Research Council (ININCA-UBA-CONICET), Buenos Aires, Argentina
- Y. Sano, T, Kanda, Yamaguchi University, Yamaguchi, Japan
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**CLINICAL UNITS**

**UO-PID Clinical Pharmacology Program and Regional Pharmacovigilance Centre**
A.O.U. “Policlinico - Vittorio Emanuele”
Catania, Italy
*Head: Filippo Drago*

**UO-PID Clinical Toxicology**
A.O.U. “Policlinico - Vittorio Emanuele”
Catania, Italy
*Head: Renato Bernardini*

**UO-PID Laboratory of Gait and Postural Analysis**
A.O.U. “Policlinico - Vittorio Emanuele”
Catania, Italy
*Head: Matteo Cioni*

**FINANCIAL SUPPORT FROM SEVERAL PHARMACEUTICAL COMPANIES**

- Network of Centres of Excellence in Neurodegeneration (CoEN) 2017
- PON-01-00110 Hippocrates
- FIR-2014
- FIR-2017
- Chance 2017

**ACHIEVEMENTS OF YOUNG RESEARCHERS**

- ECNP Research Grant for young scientist (2010)
- Levi-Montalcini program for young researchers (2011)
- Brains2South (2016)
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**Research paper selection of Biometec (2017-2020)**

The predictive value of ABCB1, ABCG2, CYP3A4/S and CYP2D6 polymorphisms for risperidone and aripiprazole plasma concentrations and the occurrence of adverse drug reactions.


The Proinflammatory Cytokine GTR1 Contributes to TRAIL-mediated Neurotoxicity in the HCN-2 Human Neuronal Cell Line.


Shedding of Microvesicles from Microglia Contributes to the Effects Induced by Metabotropic Glutamate Receptor 5 Activation on Neuronal Death.


Purinergic P2Y1 Receptors Control Rapid Expression of Plasma Membrane Processes in Hippocampal Astrocytes.


A preliminary study of endocannabinoid system regulation in psychosis: Distinct alterations of CNR1 promoter DNA methylation in patients with schizophrenia.


Extinction of avoidance behavior by safety learning depends on endocannabinoid signaling in the hippocampus.


Development of novel LP1-based analogues with enhanced delta opioid receptor profile.


P2X7 receptor antagonism: Implications in diabetic retinopathy.


Retinal and Circulating miRNAs in Age-Related Macular Degeneration: An In vivo Animal and Human Study.


Contributions of space-claim errors to apparent time dependent loss of Mg2+ block induced by NMDA.


Astrocytes contribute to Aβ-induced blood-brain barrier damage through activation of endothelial MMP9.


Buspirone Counteracts MK-801-Induced Schizophrenia-Like Phenotypes through Dopamine D3 Receptor Blockade.


Microglia Polarization, Gene-Environment Interactions and Wnt/β-Catenin Signaling: Emerging Roles of Glia-Neuron and Glia-Stem/Neuroprogenitor Crosstalk for Dopaminergic Neurorestoration in Aged Parkinsonian Brain.


Redundant modulatory effects of proinflammatory cytokines in human osteoblastic cells in vitro.


Personalized medicine: biomarkers and companion diagnostics.


HDAC1 and HDAC3 underlie dynamic H3K9 acetylation during embryonic neurogenesis and in schizophrenia-like animals.


The contribution of microglia to early synaptic compensatory responses that precede β-amyloid-induced neuronal death.


Retinal Protection and Distribution of Curcumin in Vitro and in Vivo.


Neural Stem Cell Grafts Promote Astroglia-Driven Neurorestoration in the Aged Parkinsonian Brain via Wnt/β-Catenin Signaling.

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Early compensatory responses against neuronal injury: A new therapeutic window of opportunity for Alzheimer’s Disease?

Functional Changes of Orexinergic Reaction to Psychoactive Substances.

Computational systems biology approach to identify novel pharmacological targets for diabetic retinopathy.

Visualizing pregnenolone sulfate-like modulators of NMDA receptor function reveals intracellular and plasma-membrane localization.

Metabotropic Glutamate Receptors in Gial Cells: A New Potential Target for Neuroprotection?

Wnt/β-Catenin Signaling Pathway Governs a Full Program for Dopaminergic Neuron Survival, Neurorescue and Regeneration in the MPTP Mouse Model of Parkinson’s Disease.

Tumor necrosis factor-related apoptosis-inducing ligand reduces the expression of the neuroprotective Na(+)/Ca(2+) exchanger isoform NCX3 in human neuroblastoma SH-SY5Y cells.

Peripubertal cannabinoid treatment rescues behavioral and neurochemical abnormalities in the MAM model of schizophrenia.

Different effects of prenatal MAM vs. perinatal THC exposure on regional cerebral blood perfusion detected by Arterial Spin Labelling MRI in rats.

Beneficial effects of curtailting immune susceptibility in an Alzheimer’s disease model.

Fluoxetine and Vortioxetine Reverse Depressive-Like Phenotype and Memory Deficits Induced by Aβ{1-42} Oligomers in Mice: A Key Role of Transforming growth factor-81.

Astrocytes Modify Migration of PBMCs Induced by 8-Amiloid in a Blood-Brain Barrier in vitro Model.

Retinal and circulating miRNA expression patterns in diabetic retinopathy: An in silico and in vivo approach.

The epistatic interaction between the dopamine D3 receptor and dysbindin-1 modulates higher-order cognitive functions in mice and humans.

Blood-retinal barrier protection against high glucose damage: The role of P2X7 receptor.

Aflibercept regulates retinal inflammation elicited by high glucose via the PIGF/ERK pathway.

Astrocyte-Derived Paracrine Signals: Relevance for Neurogenic Niche Regulation and Blood-Brain Barrier Integrity.

The ambiguous role of microglia in Aβ toxicity: Chances for therapeutic intervention.

Parkinson’s Disease, Aging and Adult Neurogenesis: Wnt/β-catenin signaling as the key to unlock the mystery of endogenous brain repair.