NAPLES 2023

27 • 28 • 29 SEPTEMBER

SCIENTIFIC PROGRAM

6th BRAINSTORMING RESEARCH ASSEMBLY FOR YOUNG NEUROSCIENTISTS

CESTEV Aula Magna, 1st floor
Università degli Studi di Napoli Federico II - Facoltà di Biotecnologie
Via Tommaso De Amicis 95, 80145 Napoli

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Lorenzo Marrucci	University of Naples Federico II (Italy)
Giuseppe Matarese	University of Naples Federico II, IEOS-CNR, (Italy)
Thomas C. Südhof	Nobel Laureate • Department of Molecular and Cellular Physiology, Howard Hughes Medical Institute, Stanford University School of Medicine (USA)
Maurizio Taglialatela	University of Naples Federico II (Italy)
Gioacchino Tedeschi	University of Naples Federico II (Italy)
Antonio Uccelli	IRCCS San Martino Hospital, Genoa (Italy)

INVITED SPEAKERS

Martina Absinta	Institute of Experimental Neurology, Division of Neuroscience, Vita-Salute San Raffaele University and Hospital, Milan (Italy)
Séverine Boillée	Paris Brain Institute - ICM, INSERM, Pitié-Salpêtrière Hospital, Paris (France)
Michael Khalil	Clinical Department of General Neurology, Medical University of Graz (Austria)
Richard Morris	Department of Neuroscience, The University of Edinburgh (UK)
Claudio Procaccini	Italian National Research Council (CNR), Institute Experimental Endocrinology and Oncology “Gaetano Salvatore” IEOS, Naples (Italy)
Michal Schwartz	Weizmann Institute of Science, Rehovot (Israel)
Sebastian Sulis Sato	IRCCS San Martino Hospital, Genoa (Italy)
Giuseppe Testa	University of Milan and Human Technopole (Italy)
Varun Venkataramani	Universität Heidelberg, Neurological Clinic (Germany)
Letizia Zullo	IRCCS San Martino Hospital, Genoa (Italy)

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Stefano Amoretti	University of Padova (Italy)
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Vito Antonio Baldassarro	Department of Veterinary Medical Sciences, University of Bologna (Italy)
Giulia Borgonovo	Scuola Normale Superiore (Italy)
Marta Bottero	Department of Molecular Medicine, «Sapienza» University of Rome (Italy)
Samuele Negro	University of Padova (Italy)
Paola Pacifico	Scuola Normale Superiore, Pisa (Italy)
Gianmarco Pallavicini	Department of neuroscience “Rita Levi Montalcini”, University of Turin (Italy)
Marco Rasile	Humanitas University, Rozzano (Italy)
Gabriele Sansevero	Neuroscience Institute - National Research Council of Italy, Pisa (Italy); Fondazione Umberto Veronesi, Milan (Italy)
Elisabetta Stanzani	Italian National Research Council, Milan (Italy); Humanitas Research Hospital, Rozzano (Italy)
Maria Velasco	CNIO, Madrid (Spain)

INTERNATIONAL BRAYNIACS

Fionä Caratis	Medical University of Gdańsk (Poland)
Maria F. Veloz Castillo	King Abdullah University of Science and Technology (Saudi Arabia)
Rina Demjaha	Medical University of Graz (Austria)
Marlene Khin	University of Heidelberg (Germany)
Aleksandra Rutkowska	Medical University of Gdańsk (Poland)

YOUNG EPILEPSY SECTION-ITALY, YES-ITALY, ILAE

Simona Balestrini	Department of Clinical and Experimental Epilepsy, UCL Queen Square Institute of Neurology, London (UK); Neuroscience Department, Children’s Hospital Meyer-University of Florence (Italy)

Giulia Battaglia	Neurologia universitaria, IRCCS Policlinico San Donato Milanese, Milan (Italy)
Luca De Palma	Rare and Complex Epilepsy Unit, Department of Neuroscience, Bambino Gesù Children's Hospital IRCCS, Rome (Italy)
Lorenzo Ferri	Department of Biomedical and Neuromotor Sciences, University of Bologna (Italy)

STARTING GRANT COMMITTEE

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Myriam Catalano	«Sapienza» University of Rome (Italy)
Valerio Chiurchiù	CNR and IRCCS Santa Lucia Foundation, Rome (Italy)
Paola Infante	«Sapienza» University of Rome (Italy)
Nunzio Iraci	Dept. BIOMETEC, University of Catania (Italy)

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Maria De Risi	TIGEM – Telethon Institute of Genetics and Medicine, Naples (Italy)
Sirio Cocozza	University of Naples Federico II (Italy)

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BRAYN SCIENTIFIC SESSIONS

NEUROIMAGING exploits various techniques to image the structure, function, or physiology of the nervous system. Two main neuroimaging approaches exist: i) structural imaging, which evaluates the structure of the nervous system and allows the diagnosis of large-scale intracranial diseases (such as tumors, multiple sclerosis lesions, and stroke) and injuries (like traumatic brain injury); ii) functional imaging, which is used to diagnose metabolic diseases such as Alzheimer's disease, for neurological and cognitive psychology research, as well as for building brain-computer interfaces. The most commonly used techniques for neuroimaging are Computed Tomography (CT), Diffuse Optical Imaging (DOI), Event-Related Optical Signal (EROS), Magnetic Resonance Imaging (MRI), Arterial Spin Labeling (ASL), low to ultra-high frequency ultrasound with photoacoustics, Magnetoencephalography (MEG), Electroencephalography (EEG), Positron Emission Tomography (PET), Single-Photon Emission Computed Tomography (SPECT), and cranial or functional ultrasound imaging. In this session, we will discuss the use of these techniques, both alone and in combination, to investigate, detect, and understand various aspects of neurological diseases.

NEUROINFLAMMATION is the inflammatory response initiated in the central nervous system (CNS) by resident cells or triggered by infiltrating immune cells, which causes the neuronal dysfunctions observed in inflammatory and neurodegenerative disease of the CNS. The NI session mainly focuses on basic and clinical research in multiple sclerosis (MS), Neuromyelitis Optica Spectrum Disorder (NMOSD) and other inflammatory diseases of the CNS that have a significant impact on the lives of young adults. Although the scientific discoveries of recent decades have improved the therapeutic approaches used for the treatment of such pathologies, many questions still remain unanswered. The NI session aims to discuss the basic pathogenic mechanisms governing CNS inflammation, the role of immune system in CNS autoimmunity, and the importance of genetic and environmental factors in the development of neuroinflammatory diseases, with a patient-centered focus.

NEUROPHYSIOLOGY & NEURAL PLASTICITY. We will focus on studies addressing the function of the nervous system and of its components, and the capacity of the nervous system to modify itself, functionally and structurally, in response to experience and injury. All levels of function and plastic changes are included, from the membrane and cell to systems and behaviour. Experimental approaches include molecular, cellular and developmental neurobiology, functional neuroanatomy, neurochemistry, neuropharmacology, electrophysiology, and behavioural analysis, in *in vivo*, *ex-vivo* and *in vitro* models in invertebrate or vertebrate species, including humans.

NEURO-ONCOLOGY is an emerging field of investigation that studies nervous system tumors. As many of them can cause severe nervous system damage, neuro-oncology represents a trending research area in neuroscience, which may identify the molecular mechanisms involved in tumor pathogenesis. This would ultimately lead to the development of novel therapeutic approaches for the treatment of life-threatening diseases such as glioma, and medulloblastoma. These topics will be discussed in depth during the NO session.

EPILEPSY, NEURODEVELOPMENT & NEUROGENETICS are deeply inter-connected fields. Human neurodevelopment is a dynamic and extensive process, beginning at the pre-natal stages, driven by genetic information, and influenced by many environmental factors. The alteration of this process at different levels can lead to neurodevelopmental and psychiatric disorders such as autism spectrum disorder, intellectual disability, and epilepsy. Epilepsy is one of the most common neurological diseases globally. Its etiologies cover a wide range, from genetics to trauma, auto-immunity, and tumors. Unfortunately, available therapeutics only treat the symptoms but not the root cause of the disease. This complexity has pushed epilepsy research to embrace many different fields of neuroscience, to discover the pathophysiological processes that cause and sustain seizures, and potential therapeutic targets. In this session we discuss how new insights from the fields of epilepsy research, developmental disorder and neurogenetics can improve our understanding of the human brain and contribute to novel therapeutic perspectives.

NEURODEGENERATION is a key aspect of a large number of diseases characterized by progressive damage of the nervous system that leads to irreversible neuronal death, such as Parkinson's disease (PD) and Alzheimer's disease (AD). PD is a slowly progressive syndrome that begins insidiously, gradually worsens in severity, and usually affects one side of the body before spreading to involve the other side. Rest tremor is often the first symptom recognized by the patient, but the illness sometimes begins with bradykinesia, and in some patients, tremor may never develop. AD is the most common type of dementia and it is an irreversible, neurodegenerative and progressive central nervous system disorder that slowly destroys memory and thinking skills, and, eventually, other mental abilities. Other examples of neurodegenerative diseases are tauopathies, narcolepsy, depression and psychiatric disorders. During the BraYn conference, we will be updated on the more recent advances in the field.

CLINICAL NEUROSCIENCE is a translational field in which neuroscience data and basic research are coupled with clinical neurology to better understand the neural underpinnings of nervous system disorders, and to improve their diagnosis and treatment. In this session, we encourage the submission of data with a clear translational significance and real-world clinical applications. We will discuss patient-related observations derived from experimental research, clinical research, and clinical trials focusing especially on the potential role and use of biomarkers in the clinical setting and on new treatments for neurological diseases. We also welcome works describing clinical cases (or case-series) that directly discuss the application of new therapies or novel biomarkers in a clinical population.

27 SEPTEMBER • Day 1

10:00 Registration

11:00 Opening Ceremony | **Giovanni Ferrara**

BRAYN STARTING GRANT SESSION

Chairpersons: M. Catalano, V. Chiurchiù, N. Iraci, P. Infante

11:15 **Francesca Fagiani** (Starting Grant 2022 Winner)
The aging brain in Multiple Sclerosis: profiling senescence features in CNS cells.

11:30 Lecture | **Séverine Boillée** (Chairman: G. Nardo)
Microglia and macrophages for the progression of ALS.

12:00 Lunch Box with Poster Session 1

SESSION 1 • CLINICAL NEUROSCIENCE
ORAL COMMUNICATIONS

Chairpersons: F. Di Lorenzo, A. Bombaci, I. Battistella

14:00 Lecture | **Michael Khalil** (Chairman: S. Angiari)
CSF and blood biomarkers in neuroimmunological disorders.

14:30 **Simona Baldassari** • *A Blood Brain Barrier (BBB) model to test novel therapeutic strategies for Glut-1 deficiency syndrome.*

14:45 **Tommaso Sirito** • *The early effect of cladribine versus fingolimod on clinical and MRI measures in relapsing-remitting multiple sclerosis.*

15:00 **Elena Ellmeier** • *Targeting pyruvate kinase M2 to limit T cell pathogenicity in multiple sclerosis.*

15:15 **Luca Scaccini** • *Nanostructured materials for the healing of peripheral nervous system (PNS) pathologies.*

SESSION 2 • NEUROINFLAMMATION
ORAL COMMUNICATIONS

Chairpersons: V.A. Baldassarro, M. Bottero, G. D'Arrigo, M. Velasco, F. Sciarretta

15:30	Lecture | **Michal Schwartz** (Chairman: V. Chiurchiù) *Transforming understanding of brain immunity and targeting the immune system to defeat Alzheimer's disease.*
16:00	**Fionä Caratis** • *Immune cell migration towards the blood-brain barrier is mediated by EBI2 under inflammatory conditions.*
16:15	**Giada Pessina** • *Dendritic cells generated in the presence of specialized pro-resolving mediators display a tolerogenic effect on encephalitogenic T cells.*
16:30	**BraYn Educational Symposium • Novartis ▶ Giuseppe Matarese** *The B cell therapy: the impact on bone marrow and lympho-myeloid balance.*
16:45	**BraYn Educational Symposium • Beckman Coulter ▶ Valerio Chiurchiù** *Integrated and multi-dimensional approach to dissect the neuro-immune axis in neurodegenerative diseases.*
17:00	**Federica Ricciardi** • *PEA-OXA ameliorates allodynia, neuropsychiatric and adipose tissue remodeling induced by social isolation.*
17:15	**Veronica Ceci** • *Characterization of cerebellum alterations in a mouse model of Friedreich's ataxia.*
17:30	Closing remarks

28 SEPTEMBER • Day 2

SESSION 3 • NEUROPHYSIOLOGY & NEURAL PLASTICITY
ORAL COMMUNICATIONS

Chairpersons: P. Lippiello, G. Sansevero, G. Sbrini

9:00 Lecture | **Richard Morris** (Chairman: G. Sansevero)
The neurobiology of memory: Prospective facets and selective retention over time.

9:30 **Sara De Vincentiis** • *Response of neural progenitor cells to mechanical stimulation in spinal cord injuries.*

9:45 **BraYn Educational Symposium • Voden Medical ▶ Jason Hamlin**
Using human induced pluripotent stem cell-derived model systems to study neurodevelopment, neuronal maturation and neuroinflammation.

10:00 **BraYn Educational Symposium • Revvity Italia ▶ Sergio Braglia**
Innovative technologies for neuroscience application.

10:15 **Stefano Amoretti** • *Identification of a novel factor promoting acetylcholine receptor clustering at the neuromuscular junction.*

10:30 **Eleonora De Felice** • *Physiological role of microglial diversity along the hippocampal longitudinal axis.*

10:45 **Camilla Paraciani** • *Using the FDA-approved drug vardenafil as a potential treatment to restore access to memories thought to be 'lost' in the sleep-deprived brain.*

11:00 **BraYn Educational Symposium • Siemens Healthineers Italia ▶ Domenico Zacà**
Groundbreaking Gemini gradients with a unprecedented strength for whole-body performance on a 3T MRI.

11:15 Poster Session 2 and Lunch Box (from 12:00 pm)

SESSION 4 • NEURO-ONCOLOGY
ORAL COMMUNICATIONS

Chairpersons: G. D'Alessandro, E. Stanzani, E. Vannini, P. Blanco Carlón

13:30 Lecture | **Varun Venkataramani** (Chairwomen: G. D'Alessandro, E. Vannini)
Disconnecting brain tumor networks to tackle gliomas.

14:00 **Irene Appolloni** • *Immunoevasive Phenotype of Glioma Cells: Hindering CD8 Lymphocyte Cytotoxicity through CD4 Lymphocyte Modulation.*

14:15 **BraYn Educational Symposium • Euroclone ▶ Agnieszka Ciesielska**
Reimagine how you study the brain.

14:30 **Marta Ibáñez Navarro** • *NKG2D car T cells target pediatric brain tumor cells in vitro and in a murine model of human glioblastoma in vivo.*

14:45 **Veronica Marabitti** • *Exploring the role of mitophagy in medulloblastoma stem cells dissemination and therapy resistance.*

SESSION 5 • NEUROIMAGING
ORAL COMMUNICATIONS

Chairpersons: G. Ferrara, S. Cocozza, M. Tassan Mazzocco

15:00	Lecture | **Martina Absinta** (Chairwoman: B. Bettegazzi) *Decoding and modelling chronic inflammation in multiple sclerosis.*
15:30	**Filomena Grazia Alvino** • *Synaptic-dependent developmental dysconnectivity in 22q11.2 deletion syndrome.*
15:45	**Sara Bosticardo** • *A novel method to estimate Multiple Sclerosis connectomes considering lesional tissue information.*
16:00	**BraYn Educational Symposium • Femtonics ▶ Zsolt Iván** *Neuroscience, Illuminated. Femtonics, forming the future of neuroscience.*
16:30	**BraYn Educational Symposium • Evident ▶ Luca Cevenini** *"The power to see more": optical strategies to maximize your neuroscience research.*
16:45	**Luigi Lorenzini** • *Alzheimer's genetic pathways are associated with changes in separate imaging biomarkers in non-demented individuals.*
17:00	General assembly for members of the BraYn Association Ets
17:30	Closing remarks

29 SEPTEMBER • Day 3

SESSION 6 • NEURODEGENERATION
ORAL COMMUNICATIONS

Chairpersons: S. Amoretti, S. Negro, N.P. Palomba

9:15 **Veronica Zatta** • *HSV-1 infection in mouse enteric nervous sistem: a trigger for Alzheimer's disease-like neurodegeneration hallmarks.*

9:30 **Annamaria Lia** • *Recovering stimulation of astrocyte Ca2+ signal to shed light on Alzheimer's Disease.*

9:45 **Ambra Del Grosso** • *Rapamycin ameliorates the pathological phenotype in the Twitcher mouse by autophagy activation.*

10:00 **BraYn Educational Symposium • Merck ▶ Gianmarco Bellucci**
Our evolving understanding of MS pathophysiology.

10:15 **Cristina Somma** • *Pharmacological stimulation of autophagy to rescue proteinopathy and cognitive decline in mucopolysaccharidosis-IIIA.*

10:30 **Stefania Scala** • *Design of an innovative 3D model for blood-brain barrier towards improved translational medicine approaches.*

10:45 **BraYn Educational Symposium • Miltenyi Biotec ▶ Vito Antonio Baldassarro**
Blaze light-sheet microscopy: quantifying 3D images.

11:00 Technical Talk | **Sebastian Sulis Sato & Letizia Zullo** (Chairman: G. Ferrara)
Combining molecular biology with in vivo microscopy to study brain networks.

11:50 Lecture | **Claudio Procaccini** (Chairman: G. Ferrara)
Metabolic control of immunological self-tolerance.

12:20 Poster Session 3 and Lunch Box

SESSION 7 • EPILEPSY, BRAIN DEVELOPMENT & NEUROGENETICS
ORAL COMMUNICATIONS

(curated by Young Epilepsy Section-Italy, YES-Italy, ILAE)

Chairpersons: M. Rasile, P. Scudieri, G. Ferrara, B. Casadei Garofani

14:00 Lecture | **Giuseppe Testa** (Chairman: G. Ferrara)
Towards high resolution maps of neuropsychiatric conditions: translating endophenotypes from cohorts to organoids and back.

14:30 **Greta Volpedo** • *Unique metabolic signatures may contribute to the development of post-traumatic epilepsy in mice.*

14:45 **Carla Liaci** • *The roles of RAC1 regulators ARHGAP15, TRIO, and ARHGEF6 in physiological and pathological forebrain development.*

15:00 **Federica Baronchelli** • *Mechanisms of synaptic dysfunction in the Angelman syndrome.*

15:15 Questions & Answers

15:30 Closing remarks
BraYn Awards (Best Oral & Poster Presentation, BraYn Starting Grant, Creative BraYns)

UNDER THE PATRONAGE

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