The 9th MNS Conference 2023: Navigating Neuroscience's Wide Horizon

The 9th Mediterranean Neuroscience Society (MNS) Conference 2023 held from October 14th to 18th in Carthage, Tunisia, was an unparalleled event that transcended the boundaries of conventional scientific gatherings. It was a journey through the intricate labyrinths of the human brain, illuminated by the collective wisdom of neuroscience enthusiasts from across the globe.

Where History and Science Converge:

Carthage, a UNESCO World Heritage Site, provided an enchanting backdrop for this intellectual rendezvous. Nestled along the Mediterranean coast, it served as a meeting point for researchers, scientists, clinicians, students, educators, and local authorities, all sharing a fervor for unraveling the mysteries of the brain. This conference was an opportunity to build bridges among Mediterranean neuroscientists and their global counterparts.

The Pillars of Success:

The success of the **MNS** Conference can be attributed to the dedicated efforts of many, including **Pr. Olfa Masmoudi**, the President of the Organizing Committee, **Pr. Taoufik Ghrairi**, the Associate President, **Pr. Cavaliere Giuseppe Di Giovanni**, the MNS President, **Pr. Christina Dalla**, the MNS Vice President, and all member of organizing committee: Pr. **Liana Fattore, Patrizia campolongo and** Ali Jahanshahi. Their unwavering commitment, alongside the support of organizations like **IBRO** and **FENS**, transformed this gathering into a beacon of knowledge and collaboration.

Unveiling Objectives:

The MNS works diligently to achieve three fundamental objectives. First, it strengthens collaboration among Mediterranean neuroscientists, fostering a sense of unity and purpose. Second, it promotes the importance of neuroscience education and public awareness, helping society grasp the value of brain research. Finally, it sustains scientific events, including the biennial Mediterranean Neuroscience Conference.

MNS 2023 in Numbers: An Overflow of Knowledge:

With over **250 attendees** and **176 speakers**, the MNS conference 2023, brought together a multitude of experts and enthusiasts from diverse corners of the world.

This conference was a treasure trove of knowledge, featuring an impressive array of activities. It served as an intellectual feast, featuring a staggering total of **43 symposia** that included a total of **188 thought-provoking presentations**, with **one special event** that explored the intriguing intersection of neuroscience and law. **It featured 3 captivating presentations** delving into topics such as the legal and ethical implications of neuroscience discoveries, the contribution of neuroscience to criminal law, and the need for a legal framework in neuromarketing.

Additionally, there was a workshop on publishing organized by EJN Wiley/FENS and another one focused on experimental design and reporting by NC3Rs.

The conference also boasted **5 enlightening keynote lectures** delivered by distinguished neuroscientists from around the world, and showcased **49 posters** that provided an in-depth exploration of the vast field of neuroscience.

These numbers reflect the richness and diversity of the conference, offering a glimpse into the incredible wealth of information and experiences shared during this memorable event.

Exploring Frontiers: A Diverse Spectrum of Topics:

The symposia offered a panoramic view of the latest in neuroscience research, covering a wide array of crucial subjects.

From in-depth discussions on stress and glucocorticoids to the multifaceted facets of Parkinson's disease and neurobiology of social cognition across the animal kingdom, the symposia delved into the core of these intricate subjects.

Furthermore, attendees had the opportunity to explore the roles of non-neuronal cells in maintaining central nervous system homeostasis, gaining novel insights into alpha-synuclein pathology and its impact on neurodegenerative diseases, and discovering the potential therapeutic applications of cannabinoids in addressing neurodegenerative disorders.

Additionally, the symposia spanned sensory alterations in autism, the molecular targets in alcoholism and associated neuropsychiatric disorders, as well as novel insights into brain homeostasis.

These highlights only scratch the surface of the diverse and profound topics covered during the conference, underscoring the depth and breadth of the field of neuroscience.

Scientific Highlights of the First Day:

- **Opening Ceremony:**

- The conference commenced with an inaugural address by Pr. Olfa Masmoudi, Pr. Taoufik Ghrairi, and Pr. Giuseppe Di Giovanni, setting the stage for a profound exploration of neuroscience advancements and fostering a sense of community among attendees.

- The opening ceremony served as a platform to underscore the importance of collaboration and interdisciplinary exchange in neuroscience research. Speakers emphasized the need for inclusivity, diversity, and global cooperation to address the complex challenges in the field.

- **ALBA Network Symposium :**

- The esteemed speaker, Dubravka Svob Strac, elucidated ALBA's mission, advocating for greater diversity and inclusivity in neuroscience. This initiative aims to create a supportive environment for researchers from diverse backgrounds, fostering innovation and equitable representation in the field.
- The esteemed speaker, Osborne Almeida, discussed diversity, equity, and inclusivity, shedding light on the significance of addressing biases and structural barriers in neuroscience. By promoting inclusivity, the ALBA network strives to harness the full potential of diverse perspectives for scientific advancement.

- **SYMPOSIA:**

S1 "Stress and Glucocorticoids: Memory Functions and Implications for Psychiatric Disorders"

- **S1.1 Giulia Federica Mancini (Sapienza University, IRCCS Santa Lucia Foundation, Rome, Italy): "Early-life stressful experiences in the susceptibility/resilience for psychiatric disorders development later in life"**

    - The presentation provided profound insights into the complex interplay between early-life stress and the development of psychiatric disorders later in life. By examining the mechanisms underlying susceptibility and resilience, the research shed light on potential targets for intervention and prevention strategies. These findings underscored the importance of early intervention and support in mitigating long-term mental health consequences. This work not only deepened our understanding of the etiology of psychiatric disorders but also highlighted the importance of addressing childhood adversity to promote mental well-being across the lifespan.

- **S1.2 Gina Lorena Quirarte (Instituto de Neurobiología Queretaro, Universidad Nacional Autónoma de México, México): "Glucocorticoids-induced effects on memory functions of the striatum"**

    - The research elucidated the impact of glucocorticoids on memory function, offering insights into the physiological mechanisms underlying stress-related cognitive impairments. These findings not only enhanced our understanding of the neurobiology of stress but also laid the groundwork for the development of targeted interventions aimed at mitigating cognitive deficits associated with stress-related psychiatric disorders. Ultimately, this work contributed to the advancement of therapeutic strategies for enhancing cognitive resilience in individuals exposed to chronic stress.

- **S1.3 Carrie Cuttler (Washington State University, Pullman, WA, USA): "A translational examination of the effects of cannabis use on diurnal cortisol rhythms"**

    - The translational examination of cannabis use on diurnal cortisol rhythms highlighted the complex interplay between substance use and stress regulation. This research contributed to a deeper understanding of the physiological effects of cannabis and its potential implications for mental health. The findings contributed significantly to our knowledge of the complex interactions between substance use and stress physiology, highlighting the importance of considering such factors in both clinical and public health contexts.

- **S1.4 Patrizia Campolongo (Sapienza University, IRCCS Santa Lucia Foundation, Rome, Italy): "Arousal and stress effects on cannabinoid modulation of aversive memory: Insights into Post-Traumatic Stress Disorder Susceptibility"**

    - The exploration of arousal and stress effects on cannabinoid modulation of aversive memory provided valuable insights into the neurobiological basis of PTSD susceptibility. These insights are invaluable for informing the development of targeted interventions aimed at mitigating the impact of traumatic experiences and improving outcomes for individuals affected by PTSD. The findings underscored the importance of considering the intricate interplay between stress, memory, and cannabinoid signaling in the context of trauma-related disorders.

- **S1.5 Tanja Jovanovic (Wayne State University, Detroit, MI, USA): "Fear Conditioning and Extinction in Children with Trauma: Associations with Brain and Behavior"**

    - The study on fear conditioning in children with trauma underscored the intricate associations between early-life stress, brain development, and behavioral outcomes. The findings underscored the importance of understanding how early-life experiences shape brain development and influence behavioral outcomes later in life. This study contributes to the growing body of literature aimed at elucidating the pathophysiology of trauma-related disorders in pediatric populations, with implications for developing targeted interventions to support at-risk children and improve long-term outcomes.

S2 "Parkinson's Disease as a Conundrum: Specific Synucleinopathy or Circuitry Disease?"

- **S2.1 Matteo Conti (University of Rome Tor Vergata, Rome, Italy): “Functional connectivity in PD patients”**

    - The investigation into functional connectivity in PD patients revealed disruptions within neural networks associated with motor and cognitive impairments. By examining the patterns of functional connectivity in the brain, the study elucidated key insights into the underlying pathophysiology of PD. Moreover, the identified alterations in functional connectivity served as potential biomarkers for tracking disease progression and assessing treatment efficacy. This work contributes to advancing our understanding of PD's neural mechanisms and holds promise for developing more targeted therapeutic interventions aimed at alleviating both motor and cognitive symptoms in PD patients.

- **S2.2 Marta Sciascia (Neurocenter of Southern Switzerland, Lugano, Switzerland): “The Impact of sleep mediated downscaling process on theta wake activity in Parkinson’s disease”**

    - The research on sleep-mediated downscaling processes in Parkinson’s disease shed light on the role of sleep disturbances in disease pathology. By examining the impact of these processes on theta wake activity, the study highlighted the role of disrupted sleep mechanisms in contributing to PD symptoms. Understanding these dynamics is crucial for developing targeted interventions aimed at improving sleep quality and mitigating the progression of PD. This research paved the way for novel therapeutic strategies to alleviate symptoms and enhance the overall quality of life for individuals affected by PD.

- **S2.3 Alain Kaelin (Università della Svizzera Italiana, Lugano & University of Bern, Switzerland): “Update on “peripheral” biomarkers in PD”**

    - The update on peripheral biomarkers in PD highlighted the potential of peripheral markers for early diagnosis and disease monitoring. This research contributed to the growing body of literature on non-invasive biomarkers, offering promising avenues for clinical translation.
      This work opens up promising avenues for clinical translation, offering hope for improved diagnostic and monitoring strategies in PD management.

- **S2.4 Di Maio Roberto (University of Pittsburgh, USA): “Exploring oxidative signalling in Parkinson's disease: uncovering complex pathways and potential therapeutic avenues”**

    - The exploration of oxidative signaling pathways in PD uncovered novel therapeutic targets for disease intervention. By elucidating the complex interplay between oxidative stress and neurodegeneration, these findings paved the way for the development of targeted neuroprotective strategies. This research represents a significant advancement in understanding PD pathophysiology and provides valuable groundwork for the development of innovative therapies aimed at slowing or halting disease progression.

S3 “Senescence: Friend or Foe for Neurodevelopment, Cancer, and Neurodegeneration”

- **S3.1 José Marco-Contelles (Institute of General Organic Chemistry, CSIC -Madrid, Spain): "Contilisant, a small molecule designed for Alzheimer's disease therapy"**

    - The presentation on Contilisant's therapeutic potential in Alzheimer's disease offered insights into novel treatment strategies targeting neuroinflammation. By focusing on Contilisant, a small molecule designed for Alzheimer's therapy, the research held promise in addressing the complex and multifactorial nature of the disease. The findings suggested that targeting neuroinflammation could be a key aspect of developing disease-modifying therapies for Alzheimer's disease. This work represents a significant contribution to the field of neurodegenerative disorders, offering potential avenues for the development of effective treatments to mitigate the progression of Alzheimer's disease.

- **S3.2 Dubravka Svob Strac (University Psychiatric Hospital Vrapce, Zagreb, Croatia): "Potential protective role of dhea(s) in cellular and animal models and subjects with dementia"**

    - The investigation into the potential protective role of DHEA(S) in dementia shed light on the neuroprotective mechanisms underlying steroid hormone action. This work contributed to the development of targeted therapies aimed at preserving cognitive function and mitigating the progression of dementia. This investigation holds promise for advancing our understanding of neurodegenerative diseases and identifying novel therapeutic strategies.

- **S3.3 Isabel Varela-Nieto (Institute for Biomedical Research Alberto Sols, CSIC-UAM &CIBERER): "Cellular senescence from early inner ear development to age-associated hearing diseases"**

    - The exploration of cellular senescence in auditory pathologies provided insights into the mechanisms underlying age-related hearing loss. By tracing cellular senescence from early inner ear development to age-associated hearing diseases, this research shed light on the progressive deterioration of auditory function with age. These findings provide potential targets for therapeutic intervention aimed at preserving auditory function and mitigating age-related hearing impairments.

- **S3.4 Manuel Collado (Health Research Institute of Santiago de Compostela, IDIS): "Time flies: Cellular senescence in aging CNS of Drosophila melanogaster"**

    - The research on cellular senescence in the aging central nervous system (CNS) of Drosophila melanogaster provided significant insights into the fundamental mechanisms of neurodegeneration. By studying the aging process in a model organism like Drosophila, this work offered valuable perspectives on how cellular senescence impacts CNS function over time. These findings have implications for understanding the aging process and developing interventions to promote healthy brain aging and mitigate age-related neurodegenerative diseases.

- **SONA Keynote Lecture:**

Amadi Ihunwo - University of the Witwatersrand, Johannesburg, South Africa, Secretary General of the Society of Neuroscientists of Africa (SONA): "*Neurogenesis in avian species: a comparative approach*"

- The revered Pr. Amadi Ihunwo's keynote lecture delved into the fascinating world of neurogenesis in avian species, offering insights into the diversity of brain development across different bird taxa. By comparing neurogenic processes in birds, his research provided valuable insights into evolutionary conservation and divergence in neural development.

- By studying birds with varied behavioral repertoires, Pr. Ihunwo identified active neurogenic regions, migratory routes of neuroblasts, and regions of new neuron integration.

- Key findings included high cell proliferation in the olfactory bulbs and subventricular zones, serving as primary neurogenic areas. Distribution of immature neurons varies across brain subdivisions, suggesting species-specific neural circuitry. Migration routes of neuroblasts differ, with distinct patterns observed in ratite birds.
- Hosted by the eminent Pr. Giuseppe Di Giovanni, the lecture fostered discussions on the implications of avian neurogenesis for our understanding of neural development and regeneration. Pr. Ihunwo's comparative approach opens new avenues for translational research, with potential applications for human neuroregeneration and neurological disorders.

Scientific Highlights of the Second Day:

- **SYMPOSIA:**

S4 "Cells, Molecules, Circuits and Behaviors: The Future of Therapeutics in Substance Use Disorders"

- **S4.1 Kathryn A. Cunningham (University of Texas Medical Branch, Galveston, Texas, USA): "Mining 5-HT2A receptor ligand discovery for substance use disorders."**
    - The exploration into 5-HT2A receptor ligand discovery unveiled promising avenues for substance use disorder therapeutics. By delving into the intricacies of 5-HT2A receptor ligands, this research identified potential targeted crucial for intervention in addiction pathology. This work not only advanced our understanding of the neurobiological mechanisms underlying substance use disorders but also paved the way for the development of novel treatment strategies aimed at combating addiction and improving outcomes for individuals affected by substance abuse.
- **S4.2 John Neumaier (University of Washington, Seattle, Washington, USA): "Neurocircuit control of oral fentanyl self-administration engages a novel role for the lateral habenula: Implications for SUD therapeutics."**
    - The presentation on the neurocircuit control of oral fentanyl self-administration revealed a novel role for the lateral habenula and provided valuable insights into

potential therapeutic targets for substance use disorder (SUD) treatment. By exploring the intricate neural circuits involved in fentanyl self-administration, the research shed light on mechanisms underlying addiction and highlighted the significance of understanding neural circuitry in developing effective therapeutic interventions for SUDs. These findings contributed to the broader effort to address the complex challenges of addiction and improve outcomes for individuals affected by substance abuse.

- **S4.3 Lauren M. Slosky (University of Minnesota Medical School, Minneapolis, MN, USA): "β-Arrestin-biased allosteric modulators of neurotensin receptor 1 for the treatment of cocaine use disorder."**
    - The presentation on β-arrestin-biased allosteric modulators of neurotensin receptor 1 offered a promising strategy for treating cocaine use disorder (CUD). By focusing on neurotensin signaling, the research unveiled a novel approach in addiction pharmacotherapy. These findings contributed to advancing our understanding of the neurobiological mechanisms underlying addiction and provided potential avenues for developing more effective treatments for CUD, addressing a significant public health concern.
- **S4.4 Liana Fattore (CNR Institute of Neuroscience, National Research Council, Cagliari, Italy): "Dual 5-HT2B antagonist-5-HT1A agonist for methamphetamine use disorder."**
    - The research on dual 5-HT2B antagonist-5-HT1A agonist therapy presented an innovative pharmacological approach to tackling methamphetamine use disorder (MUD). By targeting specific serotonin receptors, the study opened new possibilities for medication-based interventions in addiction treatment. These findings contributed to expanding the arsenal of therapeutic options for MUD, offering hope for improved outcomes in individuals struggling with substance use disorders.
- **S4.5 Noelle Anastasio (University of Texas Medical Branch, Galveston, Texas, USA): "The nociceptin receptor as a target for opioid use disorder therapeutics."**
    - The investigation into the nociceptin receptor as a therapeutic target in opioid use disorder offered a promising avenue for medication-based interventions. By identifying the nociceptin receptor as a potential target, the research provided novel insights into strategies for addressing opioid addiction and its associated consequences. These findings contributed to the development of innovative therapeutic approaches aimed at improving outcomes for individuals affected by opioid use disorder.

S5 “Understanding the online and offline representation of complex stimuli: From behavioural performance to neural mechanisms”

- **S5.1 Emiliano Macaluso (Université Claude Bernard Lyon 1, Bron, France): "Memory retrieval after the encoding of complex and naturalistic episodes."**

- The research on memory retrieval following the encoding of complex and naturalistic episodes provided valuable insights into the cognitive mechanisms involved in memory consolidation. By exploring memory processes in real-world contexts, the study advanced our understanding of how memories are formed and recalled in everyday situations. These findings contributed to the broader field of cognitive neuroscience and had implications for improving memory-related interventions and therapies.

- **S5.2 Marco Sperduti (Université Paris Cité, Paris, France): "The impact of editing on time perception for movie scenes."**
    - The research on the impact of editing on time perception for movie scenes shed light on how cinematic techniques influence temporal cognition. By examining how editing affects viewers' perception of time within film narratives, the study contributed to our understanding of the cognitive mechanisms involved in visual storytelling.
- **S5.3 Carlo Sestieri (University of Chieti, Italy): "Cognitive mechanisms supporting temporal memory for movie scenes."**
    - The investigation into the cognitive mechanisms supporting temporal memory for movie scenes provided valuable insights into how individuals perceive and retain temporal information within cinematic contexts. This research enhanced our understanding of human memory and cognition in multimedia environments.
- **S5.4 Valerio Santangelo (University of Perugia, Italy): "The representation of perceptual saliency of task-relevant objects in complex visual scenes."**
    - The research on the representation of perceptual saliency in complex visual scenes shed light on how task-relevant objects attract attention within intricate visual environments. By investigating how perceptual saliency influences attentional allocation, the study enhanced our understanding of the underlying cognitive mechanisms involved in visual processing. These insights had implications for various fields, including psychology, design, and human-computer interaction, where understanding attentional processes is crucial for optimizing user experience and task performance in complex visual environments.

S6 “Neurotransmitter dynamics and actions in neuro-astroglial networks”

- **S6.1 Marta Navarrete (Cajal Institute, Madrid, Spain): "Catching neuron-astrocyte engrams."**
    - The research on catching neuron-astrocyte engrams offered novel insights into the dynamics of neuro-astroglial interactions. By investigating how astrocytes contribute to the formation and storage of engrams, the study advanced our understanding of the complex interplay between neurons and astrocytes in neural processing and plasticity. These findings had implications for

understanding the mechanisms underlying learning, memory, and cognitive function, as well as for developing novel therapeutic strategies targeting astrocyte function in neurological disorders.

- **S6.2 Robert Zorec (University of Ljubljana, Lubljana, Slovenia): "Noradrenergic signalling and vesicle dynamics in reactive astrocytes."**
    - The research on noradrenergic signaling and vesicle dynamics in reactive astrocytes provided valuable insights into the mechanisms underlying astrocyte reactivity. By elucidating how noradrenergic signaling influences vesicle dynamics in astrocytes, the study deepened our understanding of the role of astrocytes in modulating neural function and dysfunction. These findings contributed to the growing body of knowledge on astrocyte biology and may have implications for the development of therapeutic interventions targeting astrocyte-mediated processes in neurological disorders.
- **S6.3 Nathalie Rouach (College de France, Paris, France): "A neuroglial circuit for maternal behaviors."**
    - The elucidation of a neuroglial circuit for maternal behaviors offered significant insights into the neural mechanisms underlying parental care. By identifying this circuit, the research advanced our understanding of the intricate neurobiology governing social behavior and bonding between parents and offspring. These findings contributed to a broader comprehension of the complex interplay between neural circuits and glial cells in orchestrating fundamental behaviors crucial for species survival and well-being.
- **S6.4 Dmitri Rusakov (University College London, UK): "Brain rhythm regulation by extracellular GABA waves."**
    - The investigation into brain rhythm regulation by extracellular GABA waves provided intriguing insights into the modulation of neural oscillations. By shedding light on the role of GABAergic signaling in orchestrating brain rhythms, this research expanded our understanding of the complex mechanisms governing neural synchronization and network dynamics. These findings offered valuable implications for deciphering the physiological basis of brain function and may inspire novel therapeutic strategies for neurological disorders associated with aberrant oscillatory activity.

S7 “New insights in Parkinson’s disease and other motor disorders”

- **S7.1 Aurora Zilli (Sapienza University of Rome, Italy): "Antibiotic-induced leaky gut syndrome promotes parkinsonism in mice: protective effects of rifaximin."**
    - The study on antibiotic-induced leaky gut syndrome and its promotion of parkinsonism in mice shed light on the intricate link between gut health and Parkinson's disease. By uncovering potential mechanisms of gut-brain interactions, particularly in the context of antibiotic exposure, this research offered valuable insights into the pathogenesis of Parkinson's disease. The

protective effects of rifaximin suggested promising therapeutic strategies centered around maintaining gut integrity. These findings paved the way for further exploration of gut-targeted interventions for neurodegenerative disorders.

- **S7.2 Alessandro Stefani (University of Rome Tor Vergata, Rome, Italy): "Gut microbiota dysbiosis in Parkinson's disease patients: not only an early feature but a potential biomarker of disease severity and progression."**
    - The investigation into gut microbiota dysbiosis in Parkinson's disease patients illuminated the complex interplay between the gut microbiome and disease pathology. By demonstrating that gut dysbiosis may not only precede Parkinson's disease onset but also correlate with disease severity and progression, this research underscored the potential of the gut microbiome as a diagnostic and prognostic biomarker. These findings underscored the importance of considering gut health in the management and understanding of Parkinson's disease, opening avenues for targeted interventions aimed at modulating the gut microbiota to potentially influence disease progression.
- **S7.3 Rosario Moratalla (Cajal Institute, Spain): "The origin of comorbid anxiety and depression in Parkinson’s disease."**
    - The investigation into the origin of comorbid anxiety and depression in Parkinson’s disease shed light on the intricate relationship between neurodegeneration and psychiatric symptoms. By elucidating the underlying mechanisms driving these non-motor manifestations, this research contributed to a deeper understanding of Parkinson's disease pathology beyond its motor symptoms. These insights had implications for improving the management and treatment of psychiatric comorbidities in Parkinson's disease, potentially enhancing the overall quality of life for affected individuals.
- **S7.4 Ali Jahanshahi (Maastricht University, The Netherlands): "Wireless deep brain stimulation in freely moving mice with nonresonant powering of magnetoelectric nanoparticles."**
    - The work on wireless deep brain stimulation using magnetoelectric nanoparticles represented a groundbreaking advancement in neuromodulation techniques. By enabling non-invasive and flexible deep brain stimulation, this research offered a promising avenue for the management of conditions like Parkinson's disease. The innovative approach held potential for enhancing the effectiveness and accessibility of deep brain stimulation therapy while minimizing invasive procedures and associated risks. This development underscored the ongoing progress in neurotechnology and its potential to revolutionize treatment approaches for neurological disorders.
- **S7.5 Wolters Anouk (Maastricht University, The Netherlands): "The application of magnetic nanodiscs for neuromodulation."**
    - The research on the application of magnetic nanodiscs for neuromodulation represented an innovative approach to precise and targeted modulation of neural activity. By leveraging magnetic properties, this method offered a non-invasive means of influencing brain function with high spatial resolution. The

findings paved the way for the development of novel neuromodulatory techniques that hold promise for the treatment of motor disorders and other neurological conditions. This work underscored the potential of nanotechnology to revolutionize the field of neuromodulation and improve patient outcomes.

S8 “Emerging trends in New Psychoactive Substances (NPS): From preclinical evidences to clinical perspectives”

- **S8.1 Eef Theunissen (Maastricht University, The Netherlands): "Cognitive, psychomotor and psychotomimetic effects of a synthetic cannabinoid."**
    - The study on the cognitive, psychomotor, and psychotomimetic effects of a synthetic cannabinoid offered significant insights into the neurobehavioral consequences of consuming emerging psychoactive substances. By examining various aspects of cognition and motor function, the research contributed to our understanding of the potential risks associated with synthetic cannabinoid use. These findings underscored the importance of continued research into the effects of novel psychoactive compounds to inform public health policies and interventions aimed at reducing substance-related harm.
- **S8.2 Jakub Wojcieszak (Medical University of Łódź, Poland): "Perinatal treatment with MDPV impairs cognitive functions in the adulthood of male but not female C57BL/6J mice."**
    - The research on the long-term cognitive effects of perinatal exposure to MDPV revealed intriguing sex-specific vulnerabilities in male C57BL/6J mice. The findings emphasized the need to consider gender differences in understanding the developmental neurotoxicity of psychoactive substances. By demonstrating differential cognitive impairments between male and female mice, this study contributed valuable insights into the complex interplay between perinatal drug exposure and long-term cognitive outcomes, highlighting the importance of sex-specific approaches in assessing the impact of novel psychoactive substances on brain function and behavior.
- **S8.3 Sabrine Bilel (University of Ferrara, Italy): "In silico, in vitro and in vivo pharmacological characterization of emerging novel synthetic opioids: focus on sex differences."**
    - The research offered a comprehensive examination of emerging novel synthetic opioids, shedding light on their pharmacological properties with a focus on sex differences. By integrating in silico, in vitro, and in vivo approaches, the study provided valuable insights into the pharmacokinetic and pharmacodynamic profiles of these opioids. The findings underscored the importance of considering sex-specific factors in opioid addiction treatment and highlight the potential for personalized therapeutic strategies tailored to individual needs. This research contributed to a deeper understanding of the complexities of opioid pharmacology and informed the development of more effective interventions for opioid use disorder.

- **S8.4 Gunes Unal (Boğaziçi University, Istanbul, Turkey): "Enhancing the antidepressant effect of ketamine via alternative routes of administration."**
    - The research on enhancing the antidepressant effect of ketamine through alternative routes of administration presented innovative strategies to improve its therapeutic efficacy while reducing adverse effects. By exploring novel delivery methods, the study aimed to optimize ketamine-based treatments for individuals with treatment-resistant depression. This research contributed to the ongoing efforts to develop more effective and tolerable interventions for depressive disorders, addressing a significant unmet need in psychiatric care.

S9 "The role of the amygdala in modulating negatively and positively valenced states"

- **S9.1 Bernard Balleine (University of NSW, Sydney, Australia): "Amygdala-cortical control of striatal plasticity"**
    - The research on the amygdala-cortical control of striatal plasticity offered fundamental insights into the neural circuits involved in reward processing and action selection. By elucidating these mechanisms, the study enhanced our understanding of motivated behavior and provided valuable information for developing interventions targeting reward-related disorders. This research contributed to advancing our knowledge of brain function and behavior, with potential implications for various psychiatric and neurological conditions.
- **S9.2 Valentina Vozella (The Scripps Research Institute, La Jolla, CA, USA): "Role of endocannabinoids in the amygdala control of stress and alcohol drinking"**
    - The research on the role of endocannabinoids in amygdala-mediated regulation of stress and alcohol drinking behavior provided valuable insights into the neurobiological mechanisms underlying addiction and stress-related disorders. By elucidating these mechanisms, the study contributed to our understanding of the complex interplay between stress, addiction, and the endocannabinoid system. Furthermore, the findings offered potential avenues for the development of novel therapeutic interventions targeting these pathways, thereby addressing critical public health challenges associated with addiction and stress-related disorders.
- **S9.3 Maria Morena (Sapienza University & IRCSS Santa Lucia Foundation, Rome, Italy): "Amygdala regulation of stress effects on fear memory processes"**
    - The research on the amygdala's regulation of stress effects on fear memory processes offered valuable insights into the neurobiology of stress-related disorders, such as anxiety and post-traumatic stress disorder (PTSD). By investigating how stress impacts fear memory processes within the amygdala, the study shed light on the mechanisms underlying stress-induced alterations in emotional memory. These findings deepened our understanding of the complex interplay between stress, memory, and emotional regulation, providing potential targets for therapeutic interventions aimed at mitigating the negative effects of stress on mental health.

- **S9.4 Cyril Herry (INSERM & University of Bordeaux, Bordeaux, France): "Decoding fear in prefrontal-amygdala circuits"**
    - The research on decoding fear in prefrontal-amygdala circuits provided valuable insights into the neural mechanisms underlying fear processing and regulation. By elucidating the intricate interactions between the prefrontal cortex and the amygdala, the study deepened our understanding of the neurobiological basis of fear-related behaviors. These findings had implications for the development of targeted interventions for anxiety disorders, offering potential avenues for therapeutic strategies aimed at modulating fear responses and improving emotional regulation.
- **S9.5 Andrew Holmes (National Institute on Alcohol Abuse and Alcoholism, Rockville, MD, USA): "Amygdala astrocytes gate the transformation of memory into action"**
    - The research on amygdala astrocytes' role in gating the transformation of memory into action offered significant insights into the cellular mechanisms shaping emotional behavior. By elucidating how astrocytes in the amygdala influence the translation of memory into behavioral responses, the study deepened our understanding of the neurobiology of decision-making and adaptive reactions to environmental stimuli. These findings had implications for understanding various psychiatric disorders characterized by dysregulated emotional responses and may pave the way for novel therapeutic strategies targeting astrocyte function in the amygdala.

S10 "Neurobiology of Social Cognition in Animal Kingdom"

- **S10.1 Giulia Salamanca (University of Bologna, Italy): "Where do the atypical long-range somatostatin projections go in the brain? A neuroanatomical study"**
    - The neuroanatomical study investigating atypical long-range somatostatin projections shed light on the organization of neural circuits involved in social cognition. By mapping the trajectories of these projections in the brain, the research enhanced our understanding of the neurobiological underpinnings of social behavior. Moreover, it offered potential insights into psychiatric disorders marked by impairments in social functioning. Overall, this work contributed to elucidating the neural mechanisms underlying social behavior and may pave the way for targeted interventions in conditions characterized by social deficits.
- **S10.2 Francesco Papaleo (Italian Institute of Technology, Genoa, Italy): "Cortico-Cortical Transfer of Socially Derived Information Gates Emotion Discrimination"**
    - The research on cortico-cortical transfer of socially derived information offered valuable insights into the neural mechanisms governing emotion discrimination and social cognition. By uncovering how information is transferred between cortical areas during social interactions, the study deepened our understanding of the neural circuits involved in social behavior and emotional processing. Moreover, this research had implications not only for understanding human social cognition but also for elucidating similar processes across different

species, thus contributing to a broader understanding of the evolution of social behavior and its neural underpinnings.

- **S10.3 Julia Sliwa (Sorbonne University, Institut du Cerveau, ICM, Inserm, CNRS, Paris, France): "Comparing human and monkey neural circuits for processing social scenes"**
    - The comparative study of human and monkey neural circuits for processing social scenes shed light on the evolutionary aspects of social cognition. By comparing the neural mechanisms underlying social scene processing in humans and monkeys, the research highlighted both similarities and differences in the organization of social cognitive processes across species. These findings deepened our understanding of the neurobiological basis of social cognition and behavior, offering valuable insights into the evolutionary conservation and divergence of social cognitive processes among primates.
- **S10.4 Gernot Ernst (University of Oslo, Norway): "A translational perspective on opioids and social behaviour: from rodents to humans"**
    - The presentation on the translational perspective of opioids and social behavior provided a valuable bridge between preclinical research in rodents and clinical studies in humans. By synthesizing findings across species, the research enhanced our understanding of the neurobiological mechanisms linking opioid modulation to social behavior. This comprehensive approach shed light on the complex interplay between opioid systems and social functioning, offering insights into potential therapeutic interventions for addiction and social impairments.

S11 "Ion channels and receptors in myelin-forming glia cells"

- **S11.1 Wenjing Sun (The Ohio State University, Columbus, OH, USA): "New insights into activity-dependent myelination"**
    - The investigation into activity-dependent myelination offered valuable insights into the dynamic interplay between neural activity and myelin plasticity. By elucidating the mechanisms by which myelin responds to activity, the research advanced our understanding of how neural circuits adapt and optimize their function in response to environmental cues. These findings had implications for neurological disorders involving dysregulated myelination and may inform the development of therapeutic strategies aimed at modulating myelin plasticity to promote neural health and function.
- **S11.2 Maria Kukley (University of Sciences and Technology Houari Boumediène, Algiers, Algeria): "Glutamate receptors in the oligodendrocyte lineage cells: what is new?"**
    - The research on glutamate receptors in oligodendrocyte lineage cells provided novel insights into the involvement of glutamatergic signaling in myelination processes. By elucidating the role of these receptors in oligodendrocyte function, the study deepened our understanding of the intricate communication

between neurons and glial cells in maintaining neural circuitry. These findings may have implications for neurological disorders characterized by disrupted myelination and excitatory signaling dysregulation, offering potential targets for therapeutic intervention.

- **S11.3 Aleksandra Rutkowska (Medical University of Gdańsk, Poland): "Can we stimulate remyelination in vivo? A glance at GPR183 as novel therapeutic target"**
    - The investigation into GPR183 as a therapeutic target for stimulating remyelination in vivo presented exciting prospects for regenerative medicine in demyelinating disorders. By targeting this receptor, the research suggested potential strategies to promote myelin repair and improve neurological function. These findings opened new avenues for the development of innovative treatments for conditions like multiple sclerosis, where remyelination is crucial for halting disease progression and restoring neural integrity.
- **S11.4 Valerio Magnaghi (University of Milan, Italy): "NKCC1 and GABA-A-receptor regulation of chloride flux in peripheral nerve: are Schwann cells engaged?"**
    - The research on NKCC1 and GABA-A-receptor regulation of chloride flux in peripheral nerve shed light on the involvement of Schwann cells in maintaining chloride homeostasis and its implications for peripheral nerve function. By elucidating these mechanisms, the study contributed to our understanding of peripheral nerve disorders' neurobiology and offered potential insights for innovative therapeutic interventions aimed at restoring nerve function and alleviating neuropathic symptoms.

- **SPECIAL Event (SE): Neuroscience and Law: Lobes and Robes:**

- **SE.1 Marie Lamarche (Law clinic, Faculty of Law and Political Sciences, Bordeaux, France) & Cédric Brun (Bordeaux-Montaigne University, Bordeaux, France): "The Legal and Ethical Implications of Neuroscience Discoveries: A Framework for Balancing Societal Interests and Individual Rights"**
    - The presentation on the legal and ethical implications of neuroscience discoveries offered a comprehensive framework for navigating the complex intersection of neuroscience, law, and ethics. The work provided guidance for policymakers, legal professionals, and researchers in balancing societal interests and individual rights in the context of advancing neuroscientific knowledge.
- **SE.2 Ahmed Elkahwagy (Faculty of Law, Alexandria University, Alexandria, Egypt) & Thomas Boraud (University of Bordeaux, CNRS Bordeaux, France): "The contribution of neuroscience to Criminal Law"**
    - The exploration of the contribution of neuroscience to criminal law shed light on the potential applications of neuroscientific evidence in legal contexts. The presentation highlighted the evolving role of neuroscience in informing legal decision-making and emphasized the importance of interdisciplinary collaboration between law and neuroscience.

- **SE.3 Nihal Elbanna (Faculty of Law, Alexandria University, Alexandria, Egypt) & Marc Landry (University of Bordeaux, CNRS Bordeaux, France): "Do we need a legal framework for neuromarketing?"**
    - The discussion on the need for a legal framework for neuromarketing addressed the ethical implications of using neuroscientific techniques in marketing practices. The presentation examined the potential risks and benefits of neuromarketing and advocated for regulatory measures to ensure ethical standards and consumer protection.

- **WORKSHOP: EJN Wiley/FENS Workshop on Publishing hosted by Bernard Balleine, EJNS Editor**

- The workshop provided valuable insights into the publishing practices in neuroscience such as the process of manuscript submission, peer review, and publication in scientific journals. Attendees gained essential knowledge on navigating the publication process, understanding journal policies, and enhancing the visibility and impact of their research findings. Through interactive discussions and practical tips, participants learned how to effectively communicate their scientific discoveries to the broader neuroscience community, fostering collaboration and advancement in the field.

- **POSTER SESSION within Coffee breaks**

- During the coffee breaks of the conference, attendees had the opportunity to explore a diverse array of research presented in the form of posters. These sessions provided a dynamic platform for scientists to showcase their latest findings, spanning various disciplines within neuroscience. From innovative methodologies to groundbreaking discoveries, the posters covered a wide range of topics, offering insights into the forefront of neuroscientific research. Attendees engaged directly with poster presenters, exchanging ideas, providing feedback, and establishing connections that could potentially lead to future collaborations. The poster sessions facilitated a vibrant atmosphere of scientific discourse and networking, enhancing the overall conference experience for all participants.

S12 "Non-neuronal mechanisms of motivated behavior"

- **S12.1 Debra Bangasser (Georgia State University, Atlanta, GA, USA): "Early resource scarcity causes lasting effects on cognition and non-neuronal cortical cells"**
    - The research on the effects of early resource scarcity on cognition and non-neuronal cortical cells provided valuable insights into the long-lasting consequences of early-life experiences on brain function and behavior. By elucidating these effects, the study enhanced our understanding of the intricate

interplay between environmental factors and neural circuitry development, underscoring the importance of early-life interventions in promoting healthy brain development and cognitive outcomes.

- **S12.2 Pavel Ortinski (University of Kentucky, Lexington, KY, USA): "Cocaine self-administration increases voltage-gated signaling in accumbens astrocytes"**
    - The research on the effects of cocaine self-administration on voltage-gated signaling in accumbens astrocytes offered crucial insights into the neurobiological underpinnings of addiction. By uncovering the cellular adaptations associated with drug-seeking behavior, the study provided valuable information for understanding addiction vulnerability and potential targets for therapeutic intervention. These findings contributed to our broader understanding of the complex neural changes that occur in response to chronic drug exposure.
- **S12.3 Jared Young (University of California, San Diego, CA, USA): "Impact of HIV on motivation and risk-taking: Activated microglia as a potential treatment target"**
    - The research on the impact of HIV on motivation and risk-taking underscored the significance of activated microglia as a potential treatment target. By elucidating the neurobiological mechanisms underlying cognitive and behavioral changes associated with HIV infection, the study provided valuable insights for therapeutic intervention. These findings may inform the development of targeted treatments aimed at addressing the cognitive and behavioral challenges faced by individuals living with HIV, ultimately improving their quality of life.
- **S12.4 Michael Scofield (University of South Carolina, Columbia, SC, USA): "Ca2+ Activity Profiles of Cortical Astrocytes During Conditioned Reward Seeking"**
    - The study on the calcium activity profiles of cortical astrocytes during conditioned reward seeking shed light on the involvement of astrocyte signaling in reward-related behaviors. By investigating the dynamic changes in calcium activity within astrocytes during reward-seeking tasks, the research advanced our understanding of the intricate interactions between neurons and glial cells in modulating motivated behavior. These findings contributed to the growing body of literature on the role of astrocytes in neural circuits underlying reward processing and may have implications for developing novel therapeutic strategies for reward-related disorders.
- **S12.5 Jill Turner (University of Kentucky, Lexington, KY, USA): "Microglia Regulate Sex- and Region-Specific Blood-Brain Barrier Integrity During Nicotine Withdrawal"**
    - The research on the regulation of blood-brain barrier integrity by microglia during nicotine withdrawal provided crucial insights into the sex- and region-specific differences in neuroimmune responses. By elucidating how microglia modulate blood-brain barrier function during nicotine withdrawal, the study advanced our understanding of the complex interplay between neuroimmune mechanisms and addictive behaviors. These findings had significant implications for developing targeted interventions to alleviate the adverse effects of nicotine withdrawal and mitigate the risk of relapse in nicotine addiction.

S13 “Diverse Neurobiological Actions of Cannabinoids in the Brain”

- **S13.1 Roberto Colangeli (Università Politecnica delle Marche, Ancona, Italy): “2-AG-mediated control of GABAergic plasticity in physiological and pathological condition”**
    - The investigation into 2-arachidonoylglycerol (2-AG)-mediated control of GABAergic plasticity illuminated its roles in both physiological and pathological conditions. By unraveling the intricate mechanisms through which 2-AG modulates GABAergic plasticity, the research offered valuable insights into the diverse neurobiological actions of cannabinoids in the brain. These findings had implications for understanding the regulatory mechanisms underlying synaptic plasticity and may inform the development of novel therapeutic strategies targeting the endocannabinoid system in various neurological and psychiatric disorders.
- **S13.2 Matthew Hill (Hotchkiss Brain Institute, University of Calgary, Canada): “Endocannabinoid signaling governs stress-induced activation and termination of neural activity within corticotropin-releasing hormone neurons in the paraventricular nucleus of the hypothalamus”**
    - The research on endocannabinoid signaling's role in stress-induced activation and termination of neural activity provided crucial insights into stress regulation mechanisms. By elucidating how endocannabinoids govern the activity of corticotropin-releasing hormone neurons in the paraventricular nucleus of the hypothalamus during stress, the study shed light on the complex interplay between the endocannabinoid system and the stress response. These findings deepened our understanding of how cannabinoids modulate stress responses in the brain, offering potential targets for therapeutic interventions aimed at managing stress-related disorders.
- **S13.3 Stephanie Borgland (University of Calgary, Canada): “Sex differences in effects of perinatal cannabis exposure on metabolism and emotional behavior in adult offspring”**
    - The study on sex differences in the effects of perinatal cannabis exposure offered critical insights into the long-term ramifications of early cannabinoid exposure on both metabolism and emotional behavior in adult offspring. By examining how male and female offspring respond differently to perinatal cannabis exposure, the research underscored the importance of considering sex-specific responses in understanding the impact of prenatal drug exposure. These findings have significant implications for public health policies and interventions aimed at mitigating the potential adverse effects of cannabis use during pregnancy.
- **S13.4 Ryan McLaughlin (Washington State University, WA, USA): “Using rodent models to identify behavioral and biological predictors of problematic cannabis use”**
    - The research on using rodent models to identify predictors of problematic cannabis use significantly contributed to our comprehension of the neurobiological underpinnings of cannabis addiction. By leveraging animal models, the study elucidated behavioral and biological markers associated with problematic cannabis use, offering valuable insights into the mechanisms driving addiction vulnerability. Moreover, these findings hold promise for the development of personalized interventions tailored to individuals at risk

of experiencing cannabis-related difficulties, thereby addressing a pressing public health concern.

S14 "Interplay of estrogens, antidepressants and behavior: classical and rapid effects"

- **S14.1 Polymnia Georgiou (University of Wisconsin Milwaukee, Milwaukee, WI, USA): "Estrogen Receptor β Modulates Depressive phenotypes via an Amygdala-Nucleus Accumbens Pathway"**
    - The research on the modulation of depressive phenotypes by estrogen receptor β provided valuable insights into the neurobiological mechanisms underlying the antidepressant effects of estrogen signaling. By focusing on the amygdala-nucleus accumbens pathway, the study shed light on the intricate interplay between estrogen receptors and key brain circuits involved in mood regulation. These findings contributed to a deeper understanding of the hormonal influences on mood disorders and may pave the way for novel therapeutic interventions targeting estrogen signaling pathways in depression.
- **S14.2 Elena Choleris (University of Guelph, Ontario, Canada): "Hormone regulation of brain circuits of social cognition in male and female mice"**
    - The research on hormone regulation of brain circuits involved in social cognition offered valuable insights into the complex interplay between hormones and social behavior, particularly in male and female mice. By investigating the neural circuits underlying social cognition, the study highlighted sex differences in the hormonal modulation of social behavior. These findings deepened our understanding of the mechanisms through which hormones influence social cognition and may have implications for studying and addressing social deficits in various neuropsychiatric conditions.
- **S14.3 Nikos Kokras (National and Kapodistrian University of Athens, Greece): "How to integrate sex in preclinical research of antidepressants: the role of estrogens"**
    - The presentation on integrating sex in preclinical research of antidepressants underscored the critical need to account for sex-specific responses to antidepressant treatment. By highlighting the role of estrogens in mediating antidepressant effects, the research emphasized the complexity of hormonal influences on mood regulation. These insights offered valuable guidance for developing personalized treatment approaches that consider sex differences, ultimately enhancing the efficacy and precision of antidepressant therapies.
- **S14.4 Panos Zanos (University of Cyprus, Nicosia, Cyprus): "Mechanism of action of rapid-acting antidepressants"**
    - The investigation into the mechanism of action of rapid-acting antidepressants offered valuable insights into their neurobiological effects and therapeutic potential. By shedding light on the molecular pathways involved in the swift onset of antidepressant efficacy, the research deepened our understanding of how these medications work at the neural level. Moreover, the findings contributed to elucidating the complex interplay between antidepressant mechanisms and the neural circuits responsible for

mood regulation. Such knowledge is crucial for the development of novel and more effective treatments for depression.

- **S14.5 Charis Brakatselos (University of Ioannina, Greece): "Targeting affective disorders: synergies of cannabidiol and antidepressants"**
    - The exploration of the synergistic potential of cannabidiol and antidepressants in addressing affective disorders opened up intriguing possibilities for treatment. By investigating the combined therapeutic effects of these agents, the research introduced innovative approaches for managing mood disorders. This work not only shed light on novel treatment modalities in psychiatry but also enriched our understanding of the potential synergies between different pharmacological interventions in treating complex mental health conditions.

S15 "Brain extracellular matrix: organization, remodelling, and functions in health and disease"

- **S15.1 Tommaso Pizzorusso (Institute of Neuroscience, CNR, Pisa, Italy): "An Atlas of Perineuronal Net Distribution and Colocalization with Parvalbumin in the Adult Mouse Brain"**
    - The presentation on the atlas of perineuronal net distribution and its colocalization with parvalbumin in the adult mouse brain offered valuable insights into the intricate organization of the brain extracellular matrix. By mapping the distribution of perineuronal nets and their association with parvalbumin, the research provided a deeper understanding of how these structures contribute to neural circuitry and function in both healthy and diseased states. This work laid a foundation for further exploration of the role of perineuronal nets in various neurological conditions and may inspire new therapeutic strategies targeting the extracellular matrix in the brain.
- **S15.2 Alexander Dityatev (German Center for Neurodegenerative Diseases (DZNE), Magdeburg, Germany): "Neuromodulatory and neuroinflammatory mechanisms of ECM remodelling"**
    - The presentation delved into the intricate neuromodulatory and neuroinflammatory mechanisms underlying extracellular matrix (ECM) remodeling, providing crucial insights into the role of ECM in brain plasticity and pathology. By elucidating these mechanisms, the research expanded our understanding of how ECM dynamics influence neural circuit function and contribute to various neurological conditions. This work had implications for developing novel therapeutic interventions targeting ECM remodeling to mitigate brain disorders characterized by aberrant plasticity and inflammation.
- **S15.3 Juan Nacher (University of Valencia, Spanish Research Network on Mental Health (CIBERSAM), Spain): "Perineuronal nets as emerging targets for the treatment of neuropsychiatric disorders"**
    - The presentation on perineuronal nets as emerging targets for treating neuropsychiatric disorders offered promising insights into novel therapeutic strategies. By highlighting the therapeutic potential of targeting the extracellular matrix, particularly perineuronal nets, the presentation underscored the importance of modulating synaptic plasticity

and neuronal activity in various neuropsychiatric conditions. This research contributed to expanding our understanding of potential interventions for neuropsychiatric disorders, paving the way for innovative treatment approaches in this field.

- **S15.4 Laure Verret (Toulouse University and Research Center on Animal Cognition (CRCA-CBI), France): "Experience-dependent perineuronal net remodelling and memory in AD mice"**
    - The research on experience-dependent perineuronal net remodeling and memory in Alzheimer's disease (AD) mice offered valuable insights into the interplay between the extracellular matrix and memory processes in the context of cognitive decline. By elucidating the role of perineuronal nets in memory formation, particularly in AD pathology, the study identified potential targets for therapeutic interventions aimed at preserving cognitive function in AD. This research contributed to our understanding of the neurobiological mechanisms underlying memory impairments in AD and may inform the development of novel treatment strategies.

- **Keynote Lecture**

Rajita Sinha (Yale School of Medicine, CT, USA): "Stress, Drugs, and Relapse: How can neuroscience help us in improving addiction treatment?"

- The keynote lecture focused on the intersection of stress, drug addiction, and relapse, probing the neural circuits underpinning these phenomena, and emphasizing the role of neuroscience in improving addiction treatment strategies. Chronic drug use alters brain and peripheral circuits, fueling compulsive behavior and relapse risk. Stress exacerbates this, reshaping coping and self-control circuits. Pr. Sinha examined steroid hormone dysfunction's role and explores pharmacological interventions targeting these circuits. Her work suggests avenues for addiction treatment enhancement by addressing stress-induced neural changes.
- Overall, the talk addressed the neurobiological mechanisms underlying addiction and highlighted potential therapeutic interventions informed by neuroscience research.

- **MNS GENERAL ASSEMBLY**

- The session transitions to the MNS (Mediterranean Neuroscience Society) General Assembly, presided over by Chair Giuseppe Di Giovanni, MT. This assembly provided a platform for members to discuss organizational matters, future initiatives, and collaborative opportunities within the neuroscience community.

Scientific Highlights of the Third Day:

- **SYMPOSIA:**

S16 "The intertwining of inflammatory pathways in the central nervous system: physiological versus pathological implications"

- **S16.1 Youssef Anouar (INSERM, University of Rouen Normandy, France): "Role of a selenoprotein in neuroprotection: application to Parkinson's disease after intranasal"**
    - The investigation into the role of a selenoprotein in neuroprotection, particularly in Parkinson's disease after intranasal application, shed light on novel therapeutic approaches for neurodegenerative conditions. This research not only highlighted the potential of intranasal delivery for targeted neuroprotective interventions but also underscored the intricate interplay between inflammatory responses and neurodegeneration in Parkinson's disease pathophysiology.
- **S16.2 Nermeen Z. Abuelezz (Misr University for Science and Technology, Giza, Egypt): "MicroRNAs as Potential Orchestrators in Alzheimer's related inflammatory Pathology: An experience from Egypt"**
    - The exploration of microRNAs as potential orchestrators in Alzheimer's-related inflammatory pathology provided insights into the molecular mechanisms underlying neuroinflammation and neurodegeneration. Understanding the role of microRNAs in regulating inflammatory processes in Alzheimer's disease not only expanded our knowledge of disease pathology but also offered potential targets for therapeutic intervention.
- **S16.3 Marc Landry (University of Bordeaux; IMN, CNRS, France): "Analgesic effects of the relaxin family peptides in inflammatory pain"**
    - The examination of the analgesic effects of the relaxin family peptides in inflammatory pain offered promising avenues for the development of new pain management strategies. This research deepened our understanding of the diverse mechanisms involved in pain modulation and suggested the potential utility of relaxin family peptides as novel analgesics with reduced side effects compared to traditional pain medications.
- **S16.4 Amira Zaky (Alexandria University, Alexandria, Egypt): "Implication of the pleiotropic APE1/Ref-1 Redox activity in pain sensitization mechanism"**
    - The implication of the pleiotropic APE1/Ref-1 redox activity in pain sensitization mechanisms contributed to our understanding of chronic pain and suggested potential targets for therapeutic intervention. By elucidating the role of APE1/Ref-1 in pain sensitization, this research provided valuable insights into the molecular mechanisms underlying chronic pain conditions, paving the way for the development of targeted therapies for pain management.
- **S16.5 Elena Lucarini (University of Florence, Italy): "Efficacy and pharmacodynamic profile of Brassicaceae constituents in the management of chronic pain"**
    - The evaluation of the efficacy and pharmacodynamic profile of Brassicaceae constituents in chronic pain management provided valuable insights into natural compounds as potential therapeutics for pain relief. This research not only highlighted

the potential of Brassicaceae constituents as analgesic agents but also underscored the importance of exploring natural products for the development of alternative pain management strategies with potentially fewer side effects compared to conventional medications.

S17 "From neuronal plasticity to glia protection: mapping the path of resilience and vulnerability to stress"

- **S17.1 Barbara di Benedetto (University of Regensburg, Regensburg, Germany): "Molecular and morphological signatures of astroglial responses to social and emotional dysfunctions"**
    - The unraveling of molecular and morphological signatures of astroglial responses to social and emotional dysfunctions enhanced our understanding of glial involvement in stress-related disorders. This research shed light on the complex interplay between astroglial function and stress-related pathology, offering potential targets for therapeutic intervention in neuropsychiatric disorders.
- **S17.2 Benedetta Bigio (New York University School of Medicine, New York, NY, USA): "Computational approaches and exosomes to identify modifiable targets for stressrelated disorders"**
    - The utilization of computational approaches and exosomes to identify modifiable targets for stress-related disorders offered innovative avenues for precision medicine and personalized treatment strategies. By leveraging computational tools and exosome-based approaches, this research holded promise for identifying novel therapeutic targets and developing tailored interventions for stress-related psychiatric disorders.
- **S17.3 Roberta Facchinetti (Sapienza University of Rome, Italy): "Molecular changes of glia and neurons in the maladaptive response to acute stress are prevented by a single administration of ketamine in a rodent model of PTSD"**
    - The investigation of molecular changes of glia and neurons in the maladaptive response to acute stress and their prevention by ketamine administration in a rodent model of PTSD provided insights into potential therapeutic interventions for stress-related disorders. This research highlighted the therapeutic potential of ketamine in mitigating the maladaptive neurobiological responses to acute stress, offering new avenues for the treatment of PTSD and related conditions.
- **S17.4 Laura Musazzi (University of Milano Bicocca, Milan, Italy): "Mechanisms of resilience and vulnerability to chronic mild stress in rats: a role for inflammation?"**
    - The understanding of mechanisms of resilience and vulnerability to chronic mild stress in rats, particularly the role of inflammation, contributed to our knowledge of stress-related neuropsychiatric disorders. This research enhanced our understanding of the underlying mechanisms involved in stress resilience and vulnerability, providing insights into potential therapeutic targets for stress-related psychiatric conditions.
- **S17.5 Carla Nasca (New York University School of Medicine, New York, NY, USA): "Epigenetic mechanisms of neuroplasticity to stress: emerging role of mitochondria"**

- The exploration of epigenetic mechanisms of neuroplasticity to stress, with an emerging focus on mitochondria, offered novel insights into molecular pathways underlying stress resilience and vulnerability. This research provided a deeper understanding of the molecular mechanisms involved in stress-related neuropsychiatric disorders, paving the way for the development of targeted interventions to enhance resilience and mitigate vulnerability to stress.

S18 "New Perspectives in Mechanisms of Neurodegeneration"

- **S18.1 Aaron Gitler (Stanford University, CA, USA): "Two New ALS Targets (and one New Drug)"**
    - The presentation on "Two New ALS Targets (and one New Drug)" provided promising avenues for ALS therapy by elucidating two novel targets and exploring a new drug. This research expanded our understanding of the molecular mechanisms driving ALS pathology and proposed innovative therapeutic strategies for addressing this debilitating neurodegenerative disorder. By identifying new targets and potential drug candidates, this work contributed to the ongoing efforts to develop effective treatments for ALS, offering hope to patients and clinicians alike.
- **S18.2 Hilal Lashuel (Ecole Polytechnique Fédérale de Lausanne, Switzerland): "Unraveling the Complex Role of Protein Aggregation in Parkinson's Disease; From mechanisms to diagnostics and therapeutic strategies"**
    - The presentation on "Unraveling the Complex Role of Protein Aggregation in Parkinson's Disease; From mechanisms to diagnostics and therapeutic strategies" provided a comprehensive examination of the multifaceted role of protein aggregation in Parkinson's disease. By delving into mechanisms, diagnostics, and therapeutic strategies, the research offered critical insights into disease pathology and treatment avenues. It significantly advanced our understanding of the molecular underpinnings of Parkinson's disease, paving the way for the development of diagnostic tools and novel therapeutic interventions aimed at combating this debilitating neurodegenerative disorder.
- **S18.3 Siham Boumhaouad (Mohammed V University of Rabat, Rabat, Morocco): Morocco):"The Impact of Melatonin on Diurnal Variation of Extracellular Dopamine in CBA/CaJ and C57BL/6 Mice: A Comparative Study"**
    - The presentation on "The Impact of Melatonin on Diurnal Variation of Extracellular Dopamine in CBA/CaJ and C57BL/6 Mice: A Comparative Study" provided valuable insights into the potential role of melatonin in modulating dopamine signaling, particularly in the context of neurodegenerative disorders. Through a comparative study on mice, the research shed light on the circadian regulation of neurotransmitter systems, specifically dopamine, and suggested melatonin as a potential therapeutic agent for neurodegenerative diseases. This work contributed to our understanding of the intricate interplay between circadian rhythms and neurotransmitter dynamics, offering potential avenues for developing targeted therapeutic interventions.

- **S18.4 Harry Alexopoulos (National and Kapodistrian University of Athens, Greece): "Drosophila Melanogaster AsA Model System For Drug Discovery In Neurodegenerative Disorders"**
    - The presentation on "Drosophila Melanogaster As A Model System For Drug Discovery In Neurodegenerative Disorders" highlighted the innovative use of Drosophila melanogaster as a model system for identifying potential therapeutic compounds. By capitalizing on the genetic tractability and well-characterized phenotypes of Drosophila, this research accelerated the discovery of novel drug candidates for neurodegenerative diseases. The utilization of Drosophila as a model system offered unique advantages, allowing for rapid screening of compounds and identification of promising candidates for further preclinical and clinical studies.
- **S18.5 Alexia Polissidis (Biomedical Research Foundation Academy of Athens, Deree – American College of Greece): "Alpha-synuclein-induced stress sensitivity renders the Parkinson's disease brain susceptible to neurodegeneration."**
    - The research on "Alpha-synuclein-induced stress sensitivity and its role in rendering the Parkinson's disease brain susceptible to neurodegeneration" provided valuable insights into disease mechanisms. By investigating how alpha-synuclein contributes to stress sensitivity, the study shed light on the pathophysiology of Parkinson's disease. The findings suggested that targeting stress sensitivity could be a promising avenue for developing disease-modifying therapies. Overall, this research deepened our understanding of Parkinson's disease pathology and identified potential therapeutic targets for intervention.

S19 "New insights into activated kinases, multiple sclerosis and receptors mechanisms"

- **S19.1 Lamia Bouslama-Oueghlani (Sorbonne University, Paris, France): "Pak1 inactivation triggers myelin formation through actin disassembly in oligodendrocytes"**
    - The research on "Pak1 inactivation triggering myelin formation through actin disassembly in oligodendrocytes" provided novel insights into the molecular mechanisms underlying myelination. By investigating Pak1's role in actin dynamics within oligodendrocytes, the study shed light on the signaling pathways regulating myelin production. These findings contributed to our understanding of the complex process of myelination and offered potential targets for therapeutic intervention in demyelinating disorders like multiple sclerosis. Overall, this research had significant implications for the development of treatments aimed at promoting remyelination and preserving neural function.
- **S19.2 Meriam Belghith (Institut Pasteur de Tunis, Tunisia): "The fine tuning of infiltrated T cells in multiple sclerosis"**
    - The research on "The fine tuning of infiltrated T cells in multiple sclerosis" expanded our understanding of immune dysregulation in the pathogenesis of multiple sclerosis (MS). By examining the intricate mechanisms involved in the regulation of infiltrated T cells, the study provided new insights into the immunological processes underlying MS. Furthermore, the research opened up new avenues for the development of immune-modulatory therapies aimed at targeting T cell-mediated inflammation in MS. Overall,

this work had significant implications for advancing our approach to treating and managing this complex autoimmune disorder.

- **S19.3 Erika Pintér (University of Pécs, Pécs, Hungary): "Determination of the binding sites of organic polysulfides on human trpa1 by mutant variants of the receptor"**
    - The research on "Determination of the binding sites of organic polysulfides on human TRPA1 by mutant variants of the receptor" provided critical insights into the molecular mechanisms underlying TRPA1 activation. By utilizing mutant variants of the receptor, the study elucidated the specific binding sites of organic polysulfides on TRPA1, shedding light on the intricate details of TRPA1-mediated signaling pathways. These findings had significant implications for understanding the role of TRPA1 in neurological disorders and offer potential targets for pharmacological interventions aimed at modulating TRPA1 activity to treat such conditions.
- **S19.4 Rafika Ben Laamari (Institut Pasteur de Tunis, Tunisia): Tunisia):"Study of the Correlation between Herpesvirus Infection and T CD8+ Effector Cells in Patients with Multiple Sclerosis and Neuro-Behçet's Disease"**
    - The study on "Study of the Correlation between Herpesvirus Infection and T CD8+ Effector Cells in Patients with Multiple Sclerosis and Neuro-Behçet's Disease" provided valuable insights into the potential association between herpesvirus infection and T CD8+ effector cells in individuals with multiple sclerosis (MS) and neuro-Behçet's disease. By examining this correlation, the research shed light on the intricate relationship between viral infections and autoimmune responses in the context of neurological disorders. The findings underscored the possible role of viral infections in exacerbating autoimmune processes, thereby contributing to disease progression or exacerbation. This study enhanced our understanding of the multifaceted mechanisms underlying the pathogenesis of MS and neuro-Behçet's disease, paving the way for further investigations into targeted therapeutic interventions aimed at modulating viral-induced immune dysregulation in these conditions.

S20 "Novel approaches in preclinical neuroscience"

- **S20.1 Christina Dalla (National and Kapodistrian University of Athens, Greece): "Sex as a biological variable in preclinical neuropsychopharmacology"**
    - The research on "Sex as a biological variable in preclinical neuropsychopharmacology" highlighted the significance of incorporating sex differences into experimental design and data interpretation in the field of neuropsychopharmacology. By recognizing the impact of sex on biological responses to pharmacological interventions, the study emphasized the importance of personalized and gender-specific approaches to treatment development for neurological disorders. This research contributed to advancing our understanding of the complex interplay between biological sex and drug responses, ultimately facilitating the development of more effective therapeutic strategies tailored to the unique needs of male and female patients.

- **S20.2 Panagiotis Politis (Biomedical Research Foundation of the Academy of Athens, Greece): "Gene regulation networks in nervous system cancers: identification of novel pharmacological targets"**
    - The research on "Gene regulation networks in nervous system cancers: identification of novel pharmacological targets" explored the intricate gene regulation networks underlying nervous system cancers and identified novel pharmacological targets. This investigation held promise for advancing cancer therapy by uncovering molecular mechanisms relevant to nervous system malignancies. By identifying new pharmacological targets, the study opened avenues for developing targeted therapies tailored to the specific molecular characteristics of these cancers. Overall, this research contributed to deepening our understanding of cancer pathogenesis in the nervous system and provided potential avenues for therapeutic intervention.
- **S20.3 Yosra Hamdi (University of Tunis El Manar, Faculty of Sciences of Tunis, Tunisia): "Cytoprotective and Neurotrophic Effects of neuropeptide ODN and PACAP in *in vitro* and in vivo Models of Neurodegenerative Diseases"**
    - The research on the "Cytoprotective and Neurotrophic Effects of neuropeptide ODN and PACAP in in vitro and in vivo Models of Neurodegenerative Diseases" delved into the potential therapeutic benefits of neuropeptides in protecting and promoting the growth of neurons in both laboratory and animal models of neurodegenerative diseases. By demonstrating the cytoprotective and neurotrophic properties of neuropeptide ODN and PACAP, this investigation offered valuable insights into potential strategies for mitigating neurodegeneration. The findings suggested that neuropeptides could serve as promising candidates for the development of neuroprotective treatments aimed at combating various neurodegenerative disorders.
- **S20.4 Rafael Madonado (University Pompeu Fabra, Barcelona, Spain): "Involvement of gut microbiota and epigenetic factors in food addiction"**
    - The research on the "Involvement of gut microbiota and epigenetic factors in food addiction" explored the intricate interplay between gut microbiota composition, epigenetic mechanisms, and addictive behaviors related to food consumption. By investigating how these factors contribute to the development and maintenance of food addiction, the study provided novel insights into the underlying mechanisms of addictive behaviors. Furthermore, the research highlighted potential targets for addiction treatment and emphasized the significance of considering the gut-brain axis in understanding and addressing addictive disorders, particularly those related to food consumption.

S21 "Fighting neurological diseases from the intestine: impact of enteric microbiota, immune and nervous system on the gut-brain axis"

- **S21.1 Matteo Fornai (University of Pisa, Italy): "Intestinal epithelial barrier at the crossroads between the microbiota-gut-brain axis and neurodegenerative disorders."**
    - The research on the "Intestinal epithelial barrier at the crossroads between the microbiota-gut-brain axis and neurodegenerative disorders" provided crucial insights

into the intricate relationship between the gut, the brain, and neurodegenerative diseases. The study illuminated potential mechanisms underlying the pathogenesis and progression of neurological disorders. Furthermore, the research identified promising targets for therapeutic interventions aimed at modulating the gut-brain axis to alleviate symptoms and potentially slow the progression of neurodegenerative diseases.

- **S21.2 Giuseppina D'Alessandro (Sapienza University of Rome, Italy): "Gut microbiota alterations affect glioma growth and innate immune cells."**
    - The research on "Gut microbiota alterations affect glioma growth and innate immune cells" provided valuable insights into the intricate relationship between gut microbiota composition, glioma growth, and innate immune responses. By investigating how alterations in gut microbiota influence the progression of gliomas and the activity of innate immune cells, the study shed light on potential mechanisms underlying the interaction between the gut microbiota and brain tumors. Moreover, the research suggested that modulating the gut microbiota could be a promising approach for glioma therapy, offering new avenues for therapeutic intervention in brain cancer.
- **S21.3 Malvyne Derkinderen (UMR Inserm, Faculté de Médecine, Nantes, France): "Can probiotics modulate gut inflammation and induce gut-brain axis remodelling?"**
    - The research on "Can probiotics modulate gut inflammation and induce gut-brain axis remodelling?" delved into the potential of probiotics to influence gut inflammation and reshape the gut-brain axis. By investigating the effects of probiotics on gut inflammation and their subsequent impact on the communication between the gut and the brain, the study provided valuable insights into novel therapeutic strategies for neurological diseases. The research suggested that probiotics could offer a promising avenue for modulating gut-brain axis function, thereby presenting new opportunities for the development of treatments for various neurological disorders.
- **S21.4 Aitak Farzi (Otto Loewi Research Center, Medical University of Graz, Austria): "Gut-brain communication in bipolar disorder."**
    - The research on "Gut-brain communication in bipolar disorder" offered significant insights into the intricate interplay between the gut and the brain in psychiatric disorders, particularly bipolar disorder. The study shed light on novel therapeutic avenues. This research identified potential targets for the development of innovative treatment strategies aimed at modulating both the gut microbiota and central nervous system function in psychiatric disorders like bipolar disorder.
- **S21.5 Jacques Gonzales (Michigan State University, East Lansing, USA): "Early life adversity disrupts intestinal function by remodeling the enteric nervous system."**
    - The research on "Early life adversity disrupts intestinal function by remodeling the enteric nervous system" provided critical insights into the effects of early-life stress on gut function through remodeling of the enteric nervous system. By elucidating the mechanisms underlying the impact of early-life adversity on gut-brain communication, this investigation contributed to our understanding of the long-term consequences of stress on gastrointestinal health and brain function. Moreover, the findings suggested potential interventions to mitigate these effects, offering hope for improving health outcomes in individuals who have experienced early-life adversity.

- **S22.1 Vicente Felipo (Centro de Investigación Príncipe Felipe, Valencia, Spain): “Differential role of nitric oxide signaling in the deleterious effects of acute and chronic hyperammonemia”**
    - The research on the "Differential role of nitric oxide signaling in the deleterious effects of acute and chronic hyperammonemia" offered crucial insights into the pathophysiology of hepatic encephalopathy. By investigating how nitric oxide signaling contributes differently to the detrimental effects of acute and chronic hyperammonemia, this study provided valuable information for understanding the underlying mechanisms of hepatic encephalopathy development and progression. Moreover, it identified potential therapeutic targets that could lead to improved treatments for hepatic encephalopathy and its associated neurological complications.
- **S22.2 Nikolaos Pitsikas (University of Thessaly, Volos, Greece): “Nitric oxide (NO) donors. Potential candidates for the treatment of anxiety disorders?”**
    - The research on "Nitric oxide (NO) donors: Potential candidates for the treatment of anxiety disorders?" delved into the potential use of NO donors as novel pharmacological interventions for anxiety disorders. By investigating the role of NO pathways in anxiety management, this study provided valuable insights into alternative therapeutic approaches for anxiety treatment. Moreover, it highlighted the significance of targeting NO signaling in psychiatric medicine, paving the way for the development of innovative treatments to alleviate anxiety symptoms.
- **S22.3 Joanna M Wierońska (Maj Institute of Pharmacology Polish Academy of Sciences, Poland): “The role of nitric oxide dependent pathways in the procognitive activity of metabotropic glutamate receptors ligands”**
    - The research on "The role of nitric oxide-dependent pathways in the procognitive activity of metabotropic glutamate receptor ligands" delved into understanding how nitric oxide-dependent pathways contribute to the cognitive enhancement induced by metabotropic glutamate receptor ligands. By investigating these mechanisms, the study provided valuable insights into potential targets for developing cognitive enhancers and neuroprotective agents for various brain pathologies. This research opened new avenues for therapeutic interventions aimed at improving cognitive function and treating cognitive impairments associated with neurological disorders.
- **S22.4 Fella Tounsi (Mouloud Mammeri University of Tizi Ouzou, Algeria): “The role of nitric oxide signaling in brain pathologies. Therapeutic implications and their limits.”**
    - The investigation into the role of nitric oxide signaling in brain pathologies and the therapeutic implications and their limits offered critical insights into the multifaceted role of nitric oxide in neurological disorders. By examining the therapeutic potential and limitations of targeting nitric oxide signaling, this research contributed to our understanding of nitric oxide-mediated mechanisms in brain pathologies and informed the development of nitric oxide-based therapies.

- **S22.5 Paulina Bastian (Medical University of Gdansk, Poland): "2-methoxyestradiol – mediated control of nNOS and Heat Shock Proteins affects DNA in glioblastoma cells"**
    - The research on 2-methoxyestradiol-mediated control of neuronal nitric oxide synthase (nNOS) and Heat Shock Proteins (HSPs) affecting DNA in glioblastoma cells highlighted the therapeutic potential of targeting nitric oxide pathways in glioblastoma treatment. By elucidating the molecular mechanisms underlying the anticancer effects of 2-methoxyestradiol, this research offered insights into novel therapeutic strategies for glioblastoma targeting nitric oxide signaling pathways.

S23 "Novel insights into alpha-synuclein pathology and toxicity in neurodegenerative diseases"

- **S23.1 Luigi Bubacco (University of Padua, Italy): "Dopamine metabolites initiate αSynuclein-mediated impaired proteostasis and degeneration in neuronal projections"**
    - The research on "Dopamine metabolites initiate α-synuclein-mediated impaired proteostasis and degeneration in neuronal projections" provided critical insights into the pathogenesis of synucleinopathies, particularly Parkinson's disease. By elucidating how dopamine metabolites contribute to impaired proteostasis and degeneration in neuronal projections mediated by α-synuclein, this research identified novel therapeutic targets for neurodegenerative diseases. Understanding the underlying mechanisms could lead to the development of more effective treatments aimed at halting or slowing the progression of synucleinopathies.
- **S23.2 Leonidas Stefanis (University of Athens Medical School, Athens 11527, Greece): "Alpha-synuclein interplay with protein degradation systems"**
    - The research on "Alpha-synuclein interplay with protein degradation systems" offered valuable insights into the mechanisms underlying alpha-synuclein pathology and neurodegeneration. By exploring the interaction between alpha-synuclein and protein degradation systems, this research shed light on the processes contributing to synucleinopathies. The findings could potentially lead to the development of therapeutic strategies aimed at modulating protein degradation pathways to alleviate the pathological effects of alpha-synuclein accumulation in neurodegenerative diseases.
- **S23.3 Sarah-Anna Hescham (Maastricht University Medical Center, The Netherlands): "Magnetothermal nanoparticle technology alleviates parkinsonian-like symptoms in mice."**
    - The research on magnetothermal nanoparticle technology's ability to alleviate parkinsonian-like symptoms in mice represented a promising advancement in Parkinson's disease therapeutics. By leveraging innovative nanotechnology approaches, this research offered novel strategies for symptom management and disease modification in neurodegenerative disorders associated with alpha-synuclein pathology.
- **S23.4 Arianna Bellucci (University of Brescia, Italy): "Synaptic alpha-synuclein microaggregates in synucleinopathies: engine of neurodegeneration and key therapeutic targets"**

- The research on "Synaptic alpha-synuclein microaggregates in synucleinopathies" shed light on their role as engines of neurodegeneration and key therapeutic targets. By investigating synaptic alpha-synuclein microaggregates, this research provided crucial insights into the mechanisms driving neurodegeneration in synucleinopathies. Moreover, it contributed to the identification of potential therapeutic targets for the development of targeted interventions aimed at mitigating the pathological effects of alpha-synuclein accumulation in these disorders.

S24 "Sex differences in translational mechanisms of fear-based disorders"

- **S24.1 Joanna Dabrowska (Rosalind Franklin University of Medicine and Science, Chicago, IL, USA): "The integration of interoceptive signals and defensive behaviors via oxytocin receptor-expressing neurons in the bed nucleus of the stria terminalis (BNST)"**
    - The investigation into the integration of interoceptive signals and defensive behaviors via oxytocin receptor-expressing neurons in the bed nucleus of the stria terminalis (BNST) shed light on sex differences in fear-based disorders. By unraveling the neural circuits underlying fear modulation, particularly in relation to oxytocin signaling, this research offered insights into potential sex-specific therapeutic approaches for anxiety-related conditions.
- **S24.2 Arnau Ramos Prats (Medical University of Innsbruck, Austria): "Sex differences in mglu5 receptor-mediated control of negative valence in mice"**
    - The exploration of sex differences in mGlu5 receptor-mediated control of negative valence in mice provided valuable insights into the neurobiological mechanisms underlying fear-based disorders. By elucidating the role of mGlu5 receptors in the regulation of emotional processing, this research contributed to our understanding of sex-specific vulnerabilities to anxiety-related pathologies.
- **S24.3 Hanna Hörnberg (Max Delbrück Center for Molecular Medicine, Berlin, Germany): Sex differences in translational mechanisms of fear-based disorders"**
    - The research on sex differences in translational mechanisms of fear-based disorders offered important insights into the molecular pathways underlying sex-specific responses to fear and anxiety. By examining the intersection of translational neuroscience and sex differences in fear processing, this research informed the development of sex-specific therapeutic strategies for anxiety-related conditions.
- **S24.4 Raül Andero Galí (Autonomous University of Barcelona, Spain): "Sex differences in neural mechanisms of the NK3 receptor modulating fear"**
    - The investigation into sex differences in neural mechanisms of the NK3 receptor modulating fear enhanced our understanding of the neurobiological basis of sex-specific vulnerabilities to fear-based disorders. By elucidating the role of NK3 receptor signaling in fear modulation, this research provided a foundation for sex-specific approaches to anxiety disorder treatment.

S25 “Non-neuronal cells as guardians of CNS homeostasis: relevance in brain development and diseases”

- **S25.1 Marta Valenza (Sapienza University of Rome, Italy): “The role of astrocytes in mediating oligodendrocyte maturation and function: evidence with co-ultramicronized palmitoylethanolamide/luteolin in models of beta-amyloid toxicity”**
    - The exploration of the role of astrocytes in mediating oligodendrocyte maturation and function, particularly in models of beta-amyloid toxicity, highlighted the intricate interactions between non-neuronal cells in CNS homeostasis. By investigating the neuroprotective effects of co-ultramicronized palmitoylethanolamide/luteolin, this research offered insights into potential therapeutic strategies for neurodegenerative diseases.
- **S25.2 Rosa Chiara Paolicelli (University of Lausanne, Switzerland): “The Alzheimer’s disease risk gene Inpp5d modulates synaptic pruning by microglia in the developing hippocampus”**
    - The research on the modulation of synaptic pruning by microglia in the developing hippocampus, particularly in the context of Alzheimer's disease risk gene Inpp5d, provided valuable insights into the role of non-neuronal cells in brain development and disease. By elucidating the molecular mechanisms underlying microglial-mediated synaptic pruning, this research enhanced our understanding of neurodevelopmental processes and neurodegenerative disorders.
- **S25.3 Mariagrazia Grilli (University of Piemonte Orientale, Novara, Italy): “Multifaceted non-neuronal dysfunction as a novel pharmacological target in neurodevelopmental and neuropsychiatric disorders”**
    - The investigation into multifaceted non-neuronal dysfunction as a novel pharmacological target in neurodevelopmental and neuropsychiatric disorders offered a comprehensive understanding of the role of non-neuronal cells in maintaining CNS homeostasis. By exploring the therapeutic potential of targeting non-neuronal cells, particularly in conditions like autism spectrum disorders and schizophrenia, this research paved the way for innovative treatment approaches targeting CNS homeostasis.
- **S25.4 Neibla Priego (Spanish National Cancer Research Centre (CNIO), Madrid, Spain): “TIMP1 mediates astrocyte-dependent local immunosuppression in brain metastasis”**
    - The study on TIMP1-mediated astrocyte-dependent local immunosuppression in brain metastasis shed light on the complex interactions between non-neuronal cells and the immune system in CNS diseases. This research contributed to our understanding of CNS immune responses and offered insights into potential therapeutic strategies for brain cancer and other CNS pathologies.

S26 “Dissecting the complexity of neurodevelopmental disorders: from pathophysiology to novel therapeutic approaches”

- **S26.1 Marco Segatto (University of Molise, Italy): "Disruption of cholesterol homeostasis in Rett syndrome: a new role for BET proteins"**
    - The exploration of the disruption of cholesterol homeostasis in Rett syndrome unveiled a new role for BET proteins in neurodevelopmental disorders. By shedding light on the molecular mechanisms underlying Rett syndrome pathology, this research opened avenues for the development of targeted therapeutic interventions addressing cholesterol dysregulation in neurodevelopmental conditions.
- **S26.2 Elena Martín-García (Universitat Pompeu Fabra, Barcelona, Spain): "THC exposure during adolescence increases impulsivity-like behavior in adulthood in a WIN 55,212-2 self-administration mouse model"**
    - The investigation into THC exposure during adolescence and its impact on impulsivity-like behavior in adulthood using a WIN 55,212-2 self-administration mouse model offered valuable insights into the long-term effects of cannabinoid exposure on neurobehavioral outcomes. This research contributed to our understanding of the developmental consequences of cannabinoid use and informed potential preventive strategies.
- **S26.3 Tibor Stark (Masaryk University, Brno, Czech Republic): "Role of the endocannabinoid system in the pathophysiology and treatment of schizophrenia: the emerging potential of preventive approach"**
    - The examination of the role of the endocannabinoid system in the pathophysiology and treatment of schizophrenia highlighted the emerging potential of preventive approaches targeting this system. This research laid the groundwork for innovative therapeutic strategies aimed at mitigating the risk and progression of this debilitating disorder.
- **S26.4 Anna Maria Tartaglione (Italian National Institute of Health, ISS, Rome, Italy): "Enhanced expression of endogenous retroviruses in Autism Spectrum Disorder: bystander or key player?"**
    - The investigation into the enhanced expression of endogenous retroviruses in Autism Spectrum Disorder (ASD) raised intriguing questions about their role as potential key players in ASD pathology. By uncovering the potential involvement of endogenous retroviruses in ASD, this research offered novel insights into the complex etiology of neurodevelopmental disorders and suggested new avenues for therapeutic exploration.

S27 "Therapeutic Use of Cannabinoids in Neurodegenerative Disorders"

- **S27.1 Alessia Ligresti (National Research Council of Italy (ICB-CNR, Italy): "Targeting cannabinoid receptor 2 in neurodegenerative diseases: recent efforts from a medicinal chemistry perspective"**
    - The discussion on targeting cannabinoid receptor 2 in neurodegenerative diseases from a medicinal chemistry perspective offered valuable insights into the recent efforts to develop cannabinoid-based therapies. This research provided a promising direction for the development of novel therapeutic agents aimed at modulating neurodegenerative processes and ameliorating disease progression.

- **S27.2 Julian Romero (Universidad Francisco de Vitoria, Madrid, Spain): "Cannabinoid modulation of microglial function in the context of neuroinflammation"**
    - The exploration of cannabinoid modulation of microglial function in the context of neuroinflammation shed light on the intricate interplay between cannabinoids and immune responses in neurodegenerative disorders. This research enhanced our understanding of the immunomodulatory properties of cannabinoids and their potential as therapeutic agents for neuroinflammatory conditions.
- **S27.3 Eva De Lago (Universidad Complutense de Madrid, Spain): "Preclinical development of cannabinoid-based therapies in pathologies related to TDP-43 dysregulation: Amyotrophic lateral sclerosis and frontotemporal dementia"**
    - The investigation into the preclinical development of cannabinoid-based therapies in pathologies related to TDP-43 dysregulation, including Amyotrophic lateral sclerosis (ALS) and frontotemporal dementia (FTD), provided important insights into the therapeutic potential of cannabinoids for these devastating neurodegenerative diseases. This research offered promising avenues for the development of disease-modifying treatments.
- **S27.4 Mario Van Der Stelt (Leiden University, The Netherlands): "Controlling and Visualizing Lipid Signaling in the Brain"**
    - The research on controlling and visualizing lipid signaling in the brain advanced our understanding of the complex role of lipids in neurodegenerative disorders. This research paved the way for the development of innovative therapeutic strategies targeting lipid pathways to mitigate neurodegenerative processes and promote brain health.

S28 "Chemical and Molecular Tools to Understand the Brain in Health and Disease"

- **S28.1 Ismail Ahmed (New York University School of Medicine, NY, USA): "Optopharmacological tools for spatiotemporal control of neurohormone signaling and social behavior"**
    - The presentation on optopharmacological tools for spatiotemporal control of neurohormone signaling and social behavior offered innovative approaches to study neural circuits underlying social behaviors. By enabling precise control over neurohormone signaling with light, these tools provided valuable insights into the neural mechanisms governing social behavior and held potential for therapeutic interventions targeting social deficits associated with neurological disorders.
- **S28.2 Eleonora Palma (Sapienza University of Rome): "The imbalance between proepileptogenic and protective cytokines in human epilepsies"**
    - The research on the imbalance between proepileptogenic and protective cytokines in human epilepsies shed light on the molecular mechanisms underlying epilepsy pathophysiology. This work contributed to our understanding of disease mechanisms and may lead to the development of novel therapeutic strategies targeting cytokine dysregulation to prevent epileptogenesis and seizure activity.

- **S28.3 Leena Ali Ibrahim (Harvard Medical School, MA, USA): "Developmental dynamics of bottom-up and top-down input integration onto L1 interneurons in the sensory cortex"**
    - The exploration of the developmental dynamics of bottom-up and top-down input integration onto L1 interneurons in the sensory cortex provided insights into the neural circuitry underlying sensory processing. By elucidating how different inputs are integrated by L1 interneurons during development, this research enhanced our understanding of sensory circuit formation and function, with implications for neurodevelopmental disorders.
- **S28.4 Ines El Bini Dhouib (Pasteur Institute of Tunisia, Tunisia): "Insights into Parkinson's with Potassium Channels at the Forefront"**
    - The insights into Parkinson's disease with potassium channels at the forefront offered novel perspectives on the pathophysiology of Parkinson's and potential therapeutic targets. This research opened avenues for the development of targeted interventions aimed at modulating potassium channel function to alleviate Parkinsonian symptoms and slow disease progression.
- **S28.5 Hilal Lashuel (Swiss Federal Institute of Technology Lausanne, Switzerland): "Posttranslational Modifications in Parkinson's disease and Synucleinopathies: From mechanisms to novel targets and therapeutic opportunities."**
    - The discussion on posttranslational modifications in Parkinson's disease and synucleinopathies delved into the molecular mechanisms underlying protein aggregation and neurodegeneration. By elucidating the role of posttranslational modifications in disease pathogenesis, this research identified novel targets and therapeutic opportunities for the treatment of Parkinson's and related neurodegenerative disorders.

- **Keynote Lecture**

Tracey Shors (Rutgers University, Piscataway, New Jersey, USA): "*Everyday trauma – and how not to ruminate on it so much*"

- In her keynote lecture, Dr. Tracey Shors explored the pervasive impact of everyday trauma on our brains and lives. Drawing from neuroscience, she illuminated how our brains tend to ruminate on painful memories, hindering our ability to move forward and create new experiences. Dr. Shors offered practical strategies to mitigate repetitive thoughts and break free from the grip of everyday traumas. By understanding the mechanisms of rumination and employing mental and physical well-being techniques, she empowers individuals to transcend past hardships and embrace a brighter future.

- Drawing on interdisciplinary research, this keynote shed light on practical approaches to mitigate the impact of trauma on individuals' lives and mental health.

Scientific Highlights of the Fourth Day:

- **SYMPOSIA:**

S29 "Clinical, behavioral and neurodevelopmental effects of stress life span: can we identify biomarkers of vulnerability?"

- **S29.1 Annamaria Cattaneo (University of Milan, Italy): "Inflammatory biomarkers for an early screening of vulnerability and for a personalized intervention"**
    - The exploration of inflammatory biomarkers for an early screening of vulnerability and personalized intervention offered promising avenues for identifying individuals at risk of stress-related disorders. This research provided insights into potential early interventions tailored to individual vulnerability profiles, thereby advancing precision medicine approaches in mental health.
- **S29.2 Valentina Zonca (King's College London, UK): "Impairment of social behavior is associated with a different transcriptomic profile of the Habenula in vulnerable and resilient rats exposed to prenatal stress"**
    - The investigation into the transcriptomic profile of the Habenula in rats exposed to prenatal stress shed light on the underlying mechanisms of social behavior impairment. By delineating differences in vulnerable and resilient individuals, this research contributed to our understanding of stress vulnerability and resilience, offering insights into potential targets for intervention.
- **S29.3 Hannah Juncker (Amsterdam University Medical Center, The Netherlands): "From maternal psychopathology to child neurodevelopment: the role of early-life nutrition, mechanisms and promising targets for intervention"**
    - The examination of the impact of maternal psychopathology on child neurodevelopment, particularly through the lens of early-life nutrition, underscored the importance of preventive strategies. By elucidating the mechanisms involved, this research identified promising targets for intervention aimed at mitigating the adverse effects of maternal psychopathology on offspring neurodevelopment.
- **S29.4 Claudio D'Addario (University of Teramo, Italy): "Impact of stress on mental health: epigenetic biomarkers"**
    - The study on the impact of stress on mental health, focusing on epigenetic biomarkers, provided valuable insights into the molecular mechanisms underlying stress-related disorders. By identifying epigenetic signatures associated with stress, this research offered potential biomarkers for early detection and personalized treatment strategies, advancing precision psychiatry.

S30 "Precipitants of brain (mal)plasticity and pathology in the new era of precision medicine"

- **S30.1 Farida Sohrabji (Texas A&M University School of Medicine, TX, USA): "The expected and the unexpected: neuroprotective effects of estrogens for stroke diverge dependent on reproductive age"**
    - The investigation into the neuroprotective effects of estrogens for stroke, considering reproductive age, highlighted the complexities of hormonal influences on brain health. This research informed personalized stroke treatment strategies, advancing precision medicine in neurology.
- **S30.2 Ioannis Sotiropoulos (Institute of Biosciences & Applications, RCSR Demokritos, Greece): "The stressed brain: a gate along the path from depression to Alzheimer's disease"**
    - The exploration of stress as a gateway from depression to Alzheimer's disease provided critical insights into the interconnectedness of neuropsychiatric conditions. By elucidating the role of stress in disease progression, this research identified potential intervention points for preventing the transition from depression to Alzheimer's, thus contributing to precision medicine approaches in neurology.
- **S30.3 Lisa Galea (Centre for Addiction and Mental Health, Toronto, ON, Canada): "Sex differences in Negative Cognitive Bias"**
    - The investigation into sex differences in negative cognitive bias offered important insights into gender-specific vulnerabilities in mental health. This research informed tailored interventions aimed at mitigating negative cognitive biases, thereby advancing precision psychiatry.
- **S30.4 Iva D. Tzvetanova (European University Cyprus, Cyprus): "Oligodendroglial Support of Axonal Function in Health and Disease"**
    - The research on oligodendroglial support of axonal function in health and disease shed light on the underexplored role of glial cells in brain pathology. By elucidating the mechanisms underlying oligodendroglial support, this research paved the way for novel therapeutic interventions targeting glial dysfunction, thus advancing precision medicine in neurology.

S31 "Preclinical study of the mechanism of action of psychedelics"

- **S31.1 Bruno P Guiard (Centre de Recherches sur la Cognition Animale (CRCA), Toulouse, France): "Influence of the context of administration in the psychopharmacological profile of the psychedelic 5-MeO-DMT"**
    - The investigation into the influence of administration context on the psychopharmacological profile of the psychedelic 5-MeO-DMT shed light on the importance of environmental factors in modulating drug effects. By uncovering the contextual influences, this research enhanced our understanding of the mechanisms underlying psychedelic action, informing safer and more effective therapeutic applications.
- **S31.2 Amel Bouloufa (University of Lyon, France): "The prototypical hallucinogen LSD produces rapid antidepressant effects via 5-HT2B receptor activation"**

- The study on the rapid antidepressant effects of the prototypical hallucinogen LSD through 5-HT2B receptor activation offered valuable insights into the neurobiological basis of psychedelic therapy. By elucidating the receptor pathways involved, this research contributed to the development of novel treatments for depression.

- **S31.3 Jasmine J Butler (University La Charité, Berlin, Germany): "The 5-HT2A receptor agonist TCB-2 disrupts the correlative links between numerous classical neurotransmitters in the mouse brain"**

    - The exploration of the effects of the 5-HT2A receptor agonist TCB-2 on neurotransmitter correlations in the mouse brain provided important information on the neurochemical changes induced by psychedelics. By uncovering the disruptions in neurotransmitter networks, this research advanced our understanding of the mechanisms underlying psychedelic action.

- **S31.4 Danilo De Gregorio (San Raffaele University, Milan, Italy): "Role of LSD in anxiety and social behavior"**

    - The investigation into the role of LSD in anxiety and social behavior shed light on the potential therapeutic applications of psychedelics. By elucidating the behavioral effects of LSD, this research informed the development of psychedelic-assisted therapies for anxiety disorders and social difficulties.

S32 "Neurobiology of alcohol and opiates use disorders"

- **S32.1 Mickael Naassila (Université de Picardie Jules Verne, Amiens, France): "Effectiveness of psychedelics on alcohol use disorders"**

    - The research on the effectiveness of psychedelics on alcohol use disorders provided insights into novel therapeutic approaches for addiction treatment. This research informed the development of innovative interventions to address substance use disorders.

- **S32.2 Eric Augier (Center for Social and Affective Neuroscience, CSAN, Sweden): "The GABA transporter GAT-3 and GABAergic transmission in the CeA: a common role in alcohol and drug use disorder?"**

    - The investigation into the role of the GABA transporter GAT-3 and GABAergic transmission in the CeA shed light on common mechanisms underlying alcohol and drug use disorders. By elucidating the neural circuitry involved, this research identified potential targets for pharmacological interventions to treat addiction.

- **S32.3 Emmanuel Darq (Interdisciplinary Cluster for Applied Genoproteomics (GIGA-R), Belgium):"Unveiling the consequences of adolescent alcohol exposure on prefrontal cortex maturation"**

    - The study on the consequences of adolescent alcohol exposure on prefrontal cortex maturation provided insights into the long-term effects of early-life alcohol consumption on brain development. By uncovering the neurobiological alterations, this research informed preventive strategies and interventions to mitigate the impact of adolescent alcohol use.

- **S32.4 Sami Ben Hamida (Université de Picardie Jules Verne, Amiens, France): "mPFC and alcohol related-behaviors"**
    - The investigation into the medial prefrontal cortex (mPFC) and alcohol-related behaviors contributed to our understanding of the neural circuits involved in addiction. This research identified potential targets for therapeutic interventions to modulate alcohol-related behaviors.

S33 "EpiEpiNetwork MNS Symposium: Next steps on epilepsy research: from brain dysfunction and immunity to comorbidities"

- **S33.1 Gabriele Ruffolo (Sapienza University of Rome, Italy): "GABAergic neurotransmission: a common hallmark of neurodevelopmental impairment"**
    - The exploration of GABAergic neurotransmission as a common hallmark of neurodevelopmental impairment delved into the intricate role of inhibitory signaling in epilepsy pathogenesis. GABAergic dysfunction is a pivotal factor in epilepsy, contributing to hyperexcitability and seizure generation. This research not only enhanced our understanding of epilepsy mechanisms but also identified potential targets for novel antiepileptic therapies aimed at restoring inhibitory balance.
- **S33.2 Cristina Limatola (Sapienza University of Rome, Italy): "GABAergic modulation by immune cells and effects on memory"**
    - The investigation into GABAergic modulation by immune cells and its effects on memory shed light on the dynamic interplay between the immune system and brain function in epilepsy. Immune-mediated alterations in GABAergic signaling can disrupt synaptic inhibition and contribute to seizure susceptibility. This research provided crucial insights into the complex neuroimmune interactions underlying epilepsy pathophysiology.
- **S33.3 Marco Ledri (Lund University Hospital, Sölvegatan, Sweden): "Early postnatal transplantation of human stem cell-derived GABAergic interneurons alters the adult epileptic phenotype of Cntnap2 knock-out mice"**
    - The research on the early postnatal transplantation of human stem cell-derived GABAergic interneurons offers a promising therapeutic strategy for epilepsy. GABAergic interneuron dysfunction is a key feature of epilepsy, leading to network hyperexcitability and seizure generation. By transplanting GABAergic interneurons during early postnatal development, this study aimed to restore inhibitory tone and mitigate epileptic phenotypes in a mouse model. This innovative approach held significant potential for the development of cell-based therapies targeting GABAergic deficits in epilepsy.
- **S33.4 Sandra Vaz (Universidade de Lisboa, Portugal): "Cognitive comorbidities of absence seizures"**
    - The investigation into the cognitive comorbidities of absence seizures underscored the multifaceted impact of epilepsy on cognitive function. Absence seizures, characterized by brief lapses in consciousness, are often accompanied by cognitive impairments, including attention deficits and memory problems. Understanding the cognitive

sequelae of absence seizures is essential for optimizing patient care and developing tailored interventions to address cognitive comorbidities in epilepsy.

- **S33.5 Tatiana Morais (Malta University, Malta): "Absence Seizures Comorbidities and their Pharmacological Modulation"**
    - The study on absence seizures comorbidities and their pharmacological modulation addressed the pressing need for effective treatments targeting epilepsy-associated cognitive impairments. Cognitive deficits represent a significant burden for individuals with epilepsy, impacting daily functioning and quality of life. This research had the potential to improve cognitive outcomes and enhance the overall management of epilepsy.

S34 "Regulation of cognitive control from rodents to primates and humans"

- **S34.1 Emiliano Macaluso (Université Claude Bernard Lyon 1, Bron, France): "Combining external and internal signals for attentional selection: from simple visual displays to active behavior in complex virtual environments"**
    - The research on attentional selection provided valuable insights into the neural mechanisms underlying cognitive control. Attentional processes are fundamental for perception and behavior, enabling individuals to selectively attend to relevant stimuli while filtering out distractions. By elucidating the neural circuits involved in attentional selection across different behavioral contexts, this research enhanced our understanding of cognitive control and its role in adaptive behavior.
- **S34.2 Zakria Ouhaz (University of Oxford, UK): "Unravelling the contribution of the mediodorsal thalamus in reward-guided decision making: insights from rodents and primates' studies"**
    - The investigation into the contribution of the mediodorsal thalamus in reward-guided decision making offered critical insights into the neural basis of cognitive control processes. The mediodorsal thalamus plays a pivotal role in integrating motivational signals and guiding goal-directed behavior. By elucidating thalamic contributions to decision-making processes, this research enhanced our understanding of the neural circuits underlying cognitive control and adaptive decision making.
- **S34.3 Sarah Bou Sader Nehme (Holy Spirit University of Kaslik, Lebanon): "Neuroinflammatory Mechanisms of Pain Hypersensitization in A Mouse Model of Attention-Deficit/Hyperactivity Disorder (ADHD)"**
    - The study on the neuroinflammatory mechanisms of pain hypersensitization in a mouse model of ADHD highlighted the intricate interplay between neuroinflammation and cognitive function. Neuroinflammatory processes have been implicated in the pathophysiology of ADHD, contributing to cognitive impairments and behavioral symptoms. By uncovering the role of neuroinflammation in pain processing and its impact on ADHD-related cognitive deficits, this research provided novel insights into potential therapeutic targets for managing cognitive impairments in ADHD.

- **S34.4 Ilona Kotlewska (Jagiellonian University, Kraków, Poland): "Evidence for two sources of EEG theta-band activity during proactive action control: midfrontal and right lateral-prefrontal"**
    - The evidence for two sources of EEG theta-band activity during proactive action control elucidated the neural mechanisms underlying cognitive control processes. EEG theta-band activity is associated with cognitive control functions, such as response inhibition and conflict monitoring. By identifying distinct neural sources of EEG theta-band activity, this research enhanced our understanding of the neural circuits underlying proactive action control and cognitive flexibility.
- **S34.5 Radwa Khalil (Constructor University, Bremen, Germany): "Inhibitory control and creative performance in humans"**
    - The investigation into inhibitory control and creative performance in humans shed light on the cognitive processes underlying creative behavior. Inhibitory control plays a crucial role in regulating attention and suppressing prepotent responses, thereby facilitating creative thinking and problem-solving. By exploring the relationship between inhibitory control and creative performance, this research advanced our understanding of the cognitive mechanisms underlying creativity and innovation.

S35 "Molecular targets in alcoholism and associated neuropsychiatric disorders"

- **S35.1 Mohamed Kabbaj (Florida State University, FL, USA): "Effects of ketamine on alcohol drinking in rats"**
    - The study on the effects of ketamine on alcohol drinking in rats shed light on the potential therapeutic role of ketamine in alcohol use disorder. Ketamine, known for its rapid-acting antidepressant effects, may also modulate alcohol consumption behaviors through its actions on glutamatergic neurotransmission. By elucidating the neurobiological mechanisms underlying the interaction between ketamine and alcohol, this research offered insights into novel treatment strategies for alcohol use disorder.
- **S35.2 Mickael Naassila (Université de Picardie Jules Verne, Amiens, France): "Targeting epigenetic mechanisms to treat alcohol use disorder: insights from animal models"**
    - The exploration of targeting epigenetic mechanisms to treat alcohol use disorder provided a promising avenue for developing precision therapies. Epigenetic modifications, such as DNA methylation and histone acetylation, play crucial roles in regulating gene expression patterns associated with alcohol dependence. By manipulating epigenetic processes, this research aimed to restore normal gene expression profiles and alleviate the pathological changes underlying alcohol use disorder.
- **S35.3 Stefania Maccari (Campus Cité Scientifique, CNRS, Lille, France): "Perinatal stress and alcohol drinking on sleep cycle: role of metabotropic receptors"**
    - The investigation into perinatal stress and alcohol drinking on sleep cycle, focusing on the role of metabotropic receptors, elucidated the complex interactions between stress, alcohol, and sleep regulation. Perinatal stress exposure can disrupt the development of

neural circuits involved in sleep-wake regulation, leading to long-lasting alterations in sleep patterns and susceptibility to alcohol use disorder. By targeting metabotropic receptors, this research sought to identify potential therapeutic interventions to normalize sleep disturbances associated with alcoholism.

- **S35.4 Nazzareno Cannella (University of Camerino, Italy): "A reverse translational approach to evaluate individual variability in treatment response in alcoholism"**
    - The reverse translational approach to evaluate individual variability in treatment response in alcoholism addressed the critical need for personalized medicine strategies in addiction treatment. Alcohol use disorder is characterized by significant heterogeneity in treatment response, necessitating tailored interventions based on individual differences in genetic, neurobiological, and environmental factors. By integrating preclinical and clinical data, this research aimed to identify biomarkers and predictive factors to optimize treatment outcomes in alcoholism.

S36 "New insights in brain homeostasis"

- **S36.1 Thiriet Nathalie (INSERM, University of Poitiers, Poitiers, France): "Acute and chronic cocaine and nicotine change the expression of genes involved in cholesterol homeostasis in the rat dorsal striatum"**
    - The investigation into the effects of acute and chronic cocaine and nicotine on the expression of genes involved in cholesterol homeostasis in the rat dorsal striatum provided novel insights into the molecular mechanisms underlying drug-induced alterations in brain function. Cocaine and nicotine exposure can dysregulate cholesterol homeostasis, disrupting cellular processes critical for neuronal function and synaptic plasticity. By elucidating the transcriptional changes associated with drug exposure, this research enhanced our understanding of the neurobiological adaptations to substance abuse.
- **S36.2 Mélodie Devère (INSERM, Normandie University, Rouen, France): "The chemogenetic activation of a novel key subpopulation of neurons, expressing 26rfa and orexins, elucidates part of the fine and complex hypothalamic regulation of glucose and energy homeostasis"**
    - The study on the chemogenetic activation of a novel key subpopulation of neurons, expressing 26rfa and orexins, shed light on the complex hypothalamic regulation of glucose and energy homeostasis. The hypothalamus plays a central role in coordinating energy balance through the integration of metabolic signals and the modulation of feeding behavior. By manipulating specific neuronal populations, this research elucidated the neural circuits governing energy homeostasis and provided insights into potential targets for the treatment of metabolic disorders.
- **S36.3 Laila Berroug (Sultan Moulay Slimane University. Beni Mellal, Morocco): "Sex-specific neurobehavioral and biochemical effects of developmental exposure to malathion in offspring mice"**
    - The investigation into the sex-specific neurobehavioral and biochemical effects of developmental exposure to malathion in offspring mice highlighted the differential

vulnerability of male and female brains to environmental neurotoxicants. Developmental exposure to pesticides such as malathion can disrupt neurodevelopmental processes, leading to long-lasting behavioral and biochemical alterations. By elucidating sex-specific effects, this research underscored the importance of considering sex as a biological variable in neurotoxicology studies.

- **S36.4 Meriem Laaroussi (Sultan Moulay Slimane University. Beni Mellal, Morocco): "Chronic exposure to inorganic mercury affects neurobehavioral and oxidative stress in female mice"**
    - The study on the chronic exposure to inorganic mercury and its effects on neurobehavioral function and oxidative stress in female mice provided valuable insights into the neurotoxic effects of heavy metal exposure. Chronic mercury exposure can induce oxidative stress and impair neurobehavioral function, contributing to cognitive deficits and motor dysfunction. By elucidating the mechanisms underlying mercury-induced neurotoxicity, this research informed strategies for mitigating the adverse effects of environmental heavy metal exposure on brain health.

- **Experimental Design and Reporting by NC3Rs (National Centre for the Replacement, Refinement, and Reduction of Animals in Research)**

Speakers: Nathalie Percie du Sert, Esther Pearl & Stephen Turnock

- The speakers presented pioneering insights into experimental design and reporting standards. Their collaborative efforts aimed to enhance the reproducibility, robustness, and ethical integrity of preclinical research involving animal models. By advocating for the adoption of rigorous experimental methodologies and transparent reporting practices, NC3Rs contributes to the advancement of scientific knowledge while minimizing animal use and optimizing animal welfare. This session provided invaluable guidance to researchers seeking to improve the quality and translational relevance of their preclinical studies.

S37 "The "invisible" disability: neurological disorders including chronic pain and epilepsy"

- **S37.1 Katarzyna Starowicz (Maj Institute of Pharmacology Polish 28cademy of Sciences, Kraków, Poland): "Therapeutic potential of endocannabinoids for the treatment of chronic pain and associated cognitive impairment"**
    - The exploration of the therapeutic potential of endocannabinoids for the treatment of chronic pain and associated cognitive impairment represented a significant advancement in pain management research. Chronic pain often accompanies neurological disorders, severely impacting cognitive function and quality of life. This investigation not only shed light on the analgesic properties of endocannabinoids but also underscored their neuroprotective effects, offering promising avenues for the development of innovative therapeutics that address both pain relief and cognitive enhancement in patients suffering from chronic pain conditions.

- **S37.2 Livio Luongo (University of Campania Luigi Vanvitelli, Naples, Italy): "Potential role of the hydroxyl carboxylic acid receptor type 2 (HCAR2) in microglia pathophysiology and pain implications"**
    - The examination of the potential role of the hydroxyl carboxylic acid receptor type 2 (HCAR2) in microglia pathophysiology and pain implications provided crucial insights into the intricate mechanisms underlying chronic pain disorders. Microglia, the resident immune cells of the central nervous system, play a pivotal role in neuroinflammation and pain processing. This research elucidated the involvement of HCAR2 in modulating microglial function, offering promising avenues for the development of targeted interventions aimed at mitigating pain-associated neuroinflammation and improving patient outcomes.
- **S37.3 Cristiano Bombardi (University of Bologna, Bologna, Italy): "5-HT2CR endocannabinoids interaction in absence epilepsy"**
    - The investigation into the interaction between 5-HT2CR and endocannabinoids in absence epilepsy shed light on the complex interplay between neurotransmitter systems in epileptic disorders. Absence epilepsy, characterized by recurrent seizures and altered consciousness, poses significant challenges in treatment. This research uncovered potential therapeutic targets within the endocannabinoid system, opening new avenues for the development of more effective antiepileptic therapies that target both the serotonin and endocannabinoid signaling pathways.
- **S37.4 Rosmara Infantino (University of Campania Luigi Vanvitelli, Naples, Italy): "Old skulls tie new tricks: the therapeutic potential of the novel cannabimimetic substance Δ9-Tetrahydrocannabiphorol in the Central Post-Stroke Pain"**
    - The exploration of the therapeutic potential of the novel cannabimimetic substance Δ9-Tetrahydrocannabiphorol in central post-stroke pain presented a promising avenue for addressing the debilitating consequences of stroke-related pain. Central post-stroke pain, a neuropathic condition arising from damage to the central nervous system, often proves refractory to conventional analgesic therapies. This research highlighted the potential of Δ9-Tetrahydrocannabiphorol as a novel analgesic agent, offering hope for improved pain management strategies and enhanced quality of life for stroke survivors.
- **S37.5 Alon Friedman (Dalhousie University, Halifax, Canada): "Neuro-glia-vascular interactions in health and disease: Time for translation"**
    - The investigation into neuro-glia-vascular interactions in health and disease underscored the critical role of glial cells and blood vessels in neurological disorders, including chronic pain and epilepsy. Neurovascular dysfunction and glial cell activation contribute to the pathogenesis of various neurological conditions, exacerbating neuronal damage and impairing brain function. This research shed light on the intricate crosstalk between neurons, glia, and blood vessels, highlighting the importance of developing therapeutic interventions that target these complex interactions to alleviate symptoms and improve patient outcomes.

S38 "Maternal environment during perinatal life affects offspring brain development and life-long brain functions"

- **S38.1 Laura Dearden (University of Cambridge, UK): "Early life programming of obesity via a hypothalamic miRNA involved in fatty acid sensing"**
    - The research on the early-life programming of obesity via a hypothalamic miRNA involved in fatty acid sensing shed light on the intricate mechanisms underlying metabolic disorders. Maternal factors during the perinatal period can profoundly influence offspring health outcomes, including the predisposition to obesity. This study provided valuable insights into the epigenetic regulation of metabolic pathways, offering potential targets for interventions aimed at mitigating the long-term consequences of maternal obesity on offspring health.
- **S38.2 Oumaima Essaidi (Sultan Moulay Slimane University, Beni Mellal, Morocco): "Prenatal restraint stress affects maternal behavior, early neurobehavioral response and oxidative stress in mice pups"**
    - The investigation into how prenatal restraint stress affects maternal behavior, early neurobehavioral response, and oxidative stress in mouse pups provided crucial insights into the impact of maternal stress on offspring neurodevelopment. Prenatal stress can have enduring effects on offspring brain function and stress responsiveness, highlighting the importance of maternal well-being during pregnancy. This research underscored the need for interventions aimed at reducing maternal stress to promote optimal neurodevelopmental outcomes in offspring.
- **S38.3 Roberta Haddad-Tovolli (Institut d'Investigacions Biomèdiques August Pi i Sunyer, IDIBAPS), Barcelona, Spain): "Neuronal circuits underlying maternal dietary habits and the programming of offspring health"**
    - The exploration of the neuronal circuits underlying maternal dietary habits and the programming of offspring health provided critical insights into the role of maternal nutrition in shaping offspring brain development and lifelong health outcomes. Maternal dietary factors during pregnancy and lactation can influence offspring neurodevelopment and susceptibility to neurological disorders. This research highlighted the importance of promoting maternal nutrition as a strategy to optimize offspring brain health and prevent neurodevelopmental disorders.
- **S38.4 Stefania Maccari (University of Lille, France): "The intergenerational inheritance of early life stress is transmitted by maternal oxytocin"**
    - The investigation into the intergenerational inheritance of early-life stress transmitted by maternal oxytocin shed light on the transgenerational impact of maternal experiences on offspring neurobiology. Early-life stress can lead to alterations in maternal oxytocin signaling, which in turn affects offspring stress responsivity and behavioral outcomes. This research elucidated the mechanisms underlying the transmission of maternal stress effects across generations, emphasizing the importance of early intervention strategies to break the cycle of intergenerational transmission of stress-related disorders.

S39 "Neural Cell Metabolism in Health and Disease"

- **S39.1 Mark Rasenick (University of Illinois College of Medicine, Chicago, IL, USA) : "A biosignature for depression and antidepressant response: Roles of G proteins, lipid rafts, and the cytoskeleton"**
    - The research on identifying a biosignature for depression and antidepressant response elucidated the intricate molecular mechanisms underlying mood disorders. By investigating the roles of G proteins, lipid rafts, and the cytoskeleton, this work offered valuable insights into the pathophysiology of depression and the mechanisms of action of antidepressant treatments. Understanding these molecular pathways is critical for the development of novel therapeutics with improved efficacy and reduced side effects.
- **S39.2 Nina Vardjan (University of Ljubljana, Slovenia): "Lipid droplet homeostasis under stress and ageing"**
    - The exploration of lipid droplet homeostasis under stress and aging provided important insights into cellular metabolism and its implications for neurodegenerative diseases. Lipid droplets play crucial roles in cellular energy metabolism and lipid storage, and their dysregulation has been implicated in various pathological conditions. This research shed light on the dynamic regulation of lipid droplet dynamics and its relevance to neurodegeneration and aging-related disorders.
- **S39.3 Robert Zorec (University of Ljubljana, Slovenia): "Astroglial mechanisms of neurodegeneration and viral infection"**
    - The investigation into astroglial mechanisms of neurodegeneration and viral infection advanced our understanding of the complex interactions between glial cells and neuronal health. Astrocytes play essential roles in maintaining brain homeostasis and responding to pathological insults, including viral infections. This research shed light on the molecular pathways underlying astroglial dysfunction in neurodegenerative diseases and viral-induced neurological disorders, offering potential targets for therapeutic intervention.
- **S39.4 Natalie Rasgon (Stanford University School of Medicine, USA): "A neuroglial circuit for maternal behaviour"**
    - The elucidation of a neuroglial circuit for maternal behavior provided valuable insights into the neural basis of maternal care and its implications for offspring development. Maternal behavior is critical for offspring survival and well-being, and understanding the neural circuits underlying this behavior is essential for deciphering the mechanisms of maternal care. This research shed light on the neurobiological basis of maternal behavior, highlighting the intricate interplay between neural and glial components in shaping maternal caregiving.

S40 "New insights in neuroprotection, learning and memory mechanisms"

- **S40.1 Aldo Donizetti (Universita' degli studi di Napoli Federico II, Naples, Italy): "*In vitro* model of synaptic activity for the investigation of molecular mechanisms of synaptic plasticity and neuroprotection"**

- The development of an in vitro model of synaptic activity for investigating molecular mechanisms of synaptic plasticity and neuroprotection represented a significant advancement in the field of neuroscience. This model provides a controlled environment to study the dynamic processes underlying synaptic function and the mechanisms involved in neuroprotection against various insults. This research offered valuable insights into the molecular basis of synaptic plasticity and identified potential targets for therapeutic intervention in neurological disorders.

- **S40.2 Taoufik Ghrairi (University of Tunis El-Manar, Tunisia): "Characterization of neurotrophic potentials of Imine Analogs of Trans-Resveratrol"**

    - The characterization of the neurotrophic potentials of Imine Analogs of Trans-Resveratrol expanded our understanding of natural compounds with therapeutic potential for neuroprotection and cognitive enhancement. Neurotrophic factors play crucial roles in promoting neuronal survival, growth, and synaptic plasticity, and their modulation holds promise for the treatment of neurodegenerative diseases and cognitive impairments. This investigation into the neurotrophic properties of Imine Analogs of Trans-Resveratrol provided insights into novel therapeutic strategies for enhancing brain health and function.

- **S40.3 James Olopade (University of Ibadan, Nigeria): "Surveillance of neurotropic viruses in Nigeria: What are plans to develop novel therapies?"**

    - The surveillance of neurotropic viruses in Nigeria and plans to develop novel therapies addressed a critical aspect of neurological health in the region. Neurotropic viruses pose significant threats to neurological function and public health, particularly in regions with limited resources for diagnosis and treatment. This research aimed to identify circulating neurotropic viruses and developed effective therapeutic interventions to mitigate their impact on neurological diseases, contributing to the advancement of neurovirology and public health initiatives in Nigeria.

- **S40.4 Georgios S. Kogias (Louisiana State University, New Orleans, LA, USA): "Activation of cerebellar PCs disrupts reconsolidation of associative emotional memory"**

    - The investigation into the activation of cerebellar Purkinje cells (PCs) and its disruption of the reconsolidation of associative emotional memory shed light on the role of the cerebellum in cognitive processes beyond motor control. The disruption of memory reconsolidation presents a promising approach for the treatment of emotional and trauma-related disorders by targeting maladaptive memories. This research advanced our understanding of the neural mechanisms underlying memory processing and identified potential therapeutic targets for memory-related disorders.

- **S40.5 Latifa Dorbani-Mamine (University of Science and Technology Houari Boumediene. Bab Ezzouar, Algeria): "Cellular and molecular aspects of neurotoxicity induced in rats and rabbits by pesticides: thiamethoxam and voliam-targo"**

    - The exploration of cellular and molecular aspects of neurotoxicity induced by pesticides in rats and rabbits provided critical insights into the adverse effects of environmental toxins on brain health. Pesticide exposure poses significant risks to neurological function and is implicated in the pathogenesis of neurodevelopmental and neurodegenerative disorders. This research highlighted the cellular and molecular mechanisms underlying

pesticide-induced neurotoxicity, informing strategies for mitigating the impact of environmental toxins on brain function and health.

- **Keynote Lecture**

Daniele Piomelli (University of California, Irvine, CA, USA) : "The long-term impact of cannabis use in adolescence: it's time to take a fresh look"

- In his keynote lecture, Dr. Daniele Piomelli delved into the long-term repercussions of cannabis use during adolescence, a critical period of brain development, and long-term neurobiological consequences, emphasizing the need for a nuanced understanding of its effects on brain development, mental health, and behavior.
- He highlighted the potential vulnerability of neocortical networks to the intoxicating effects of THC, the primary psychoactive component of cannabis. Drawing from epidemiological surveys and laboratory studies in rodents, Dr. Piomelli examined the enduring cognitive and affective impairments associated with adolescent cannabis exposure, even after cessation of use. He also explored the heightened risk of schizophrenia linked to early cannabis exposure.

- Furthermore, Dr. Piomelli discussed a novel mouse model designed to simulate low-intensity adolescent cannabis exposure, offering insights into its lasting impact on brain function, particularly microglia function, and systemic energy metabolism.

- Through his lecture, Dr. Piomelli underscored the importance of reevaluating our understanding of cannabis use in adolescence and its implications for long-term brain health.

Scientific Highlights of the Fifth Day:

- **Keynote Lecture**

Riadh Gouider (Razi Hospital, Faculty of Medecine of Tunis & University of Tunis El Manar, Tunis, Tunisia): "*How Homozigosity impact our clinical neurology practice*"

- Pr. Riadh Gouider's presentation on the impact of homozygosity in clinical neurology practice provided a comprehensive exploration of the genetic underpinnings of neurological conditions.

- By elucidating how homozygosity influences the manifestation and progression of neurological disorders, he enhanced our understanding of the complex interplay between genetics and neurology. This insightful discussion not only advanced our knowledge of the molecular mechanisms involved but also highlighted the importance of genetic considerations in clinical assessment and management.

- Pr. Gouider's research contributes to the development of personalized approaches in neurology, aiming to optimize patient care and outcomes in the face of genetic variability.

- **SYMPOSIA:**

S41 "Preclinical and clinical novel insights on the mechanisms underlying human obesity and eating disorders"

- **S41.1 Mariangela Pucci (Karolinska Institute, Huddinge, Sweden): "Preclinical and clinical evidence of dopaminergic system regulation in Binge Eating"**

    - The investigation into the dopaminergic system's regulation in Binge Eating Disorder represented a significant advancement in our understanding of the neurobiology of compulsive eating behaviors. By integrating preclinical and clinical evidence, this work not only elucidated the intricate mechanisms involved but also offered potential avenues for targeted therapeutic interventions. This research has the potential to pave the way for personalized treatment approaches that address the underlying neurobiological mechanisms driving binge eating.

- **S41.2 Maria Scherma (University of Cagliari, Italy): "Neurobiological and molecular mechanisms implicated in the development of anorexia nervosa: focus on the experimental model of Activity-Based-Anorexia (ABA)"**

    - The focus on the neurobiological and molecular mechanisms implicated in anorexia nervosa, particularly through the Activity-Based-Anorexia (ABA) model, provided a comprehensive understanding of this complex disorder. This research shed light on the multifaceted interplay between genetic, environmental, and neurobiological factors contributing to the development and maintenance of anorexia nervosa. By elucidating these mechanisms, this work not only advanced our scientific knowledge but also held promise for the development of novel therapeutic strategies aimed at restoring healthy eating behaviors in individuals with anorexia nervosa.

- **S41.3 Marianna Rania (University Magna Graecia of Catanzaro, Catanzaro, Italy): "Feeding the gut, feeding the host: insights on the interplay between gut microbiome and eating behaviours in eating disorders and obesity"**

    - The exploration of the interplay between the gut microbiome and eating behaviors in eating disorders and obesity represented a groundbreaking contribution to the field. This research highlighted the bidirectional communication between the gut and brain, underscoring the significant role of gut microbiota in regulating metabolic homeostasis and food intake. By elucidating these complex interactions, this work opened new avenues for targeted interventions that modulate the gut microbiome to promote healthy eating behaviors and mitigate the risk of obesity and eating disorders.

- **S41.4 Florijan Jalsevac (Universitat Rovira i Virgili, Tarragona, Spain): "Profile of Bitter Taste Receptors in the Jejunum of Morbid Obese Patients that undergo Bariatric Surgery"**

- The investigation into the profile of Bitter Taste Receptors in the Jejunum of Morbid Obese Patients undergoing Bariatric Surgery provided valuable insights into the gustatory mechanisms influencing food intake and weight regulation. By elucidating the role of these receptors in modulating taste perception and food preferences, this research offered potential targets for therapeutic interventions aimed at promoting healthier eating habits and facilitating weight management in individuals with obesity.

- **S41.5 Bourdy Romain (CNRS/Université de Strasbourg, France): "Endocannabinoid system regulations in the reward system in obesity and binge eating disorder"**

    - The research on the regulation of the endocannabinoid system in the reward system in obesity and binge eating disorder represented a significant advancement in our understanding of the neurobiological mechanisms underlying these conditions. By investigating the role of endocannabinoid signaling in modulating reward processing and food intake, this work provided critical insights into the dysregulated neurobiology observed in obesity and binge eating disorder. Moreover, this research holds promise for the development of novel pharmacological interventions targeting the endocannabinoid system to mitigate compulsive eating behaviors and promote weight loss.

S42 "Sensory alterations in autism: From preclinical models to human studies"

- **S42.1 Ryan Stevenson (Western University, London, Ontario, Canada): "Sensory phenotypes in Autism: From neural networks to clinical profiles"**

    - The exploration of sensory phenotypes in Autism, ranging from neural networks to clinical profiles, provided valuable insights into the diverse sensory experiences of individuals with autism spectrum disorder (ASD). By unraveling the complex interplay between sensory processing and neural circuitry, this research enhanced our understanding of how sensory abnormalities manifest in ASD and informed tailored interventions to address these challenges.

- **S42.2 Aline Lefebvre (Institut Pasteur, UMR 3571 CNRS, University Paris Diderot, Paris, France): "Tackling hypo and hyper sensory processing heterogeneity in Autism: from clinical stratification to genetic pathways"**

    - The work on addressing hypo- and hypersensory processing heterogeneity in autism, from clinical stratification to genetic pathways, offered a comprehensive approach to understanding sensory abnormalities in ASD. By integrating clinical and genetic data, this research shed light on the underlying mechanisms contributing to sensory processing differences in individuals with autism, paving the way for personalized interventions tailored to the specific sensory profiles of individuals with ASD.

- **S42.3 Benjamin D. Auerbach (University of Illinois, Urbana, Illinois, USA): "Auditory Hypersensitivity and Processing Deficits in a Rat Model of Fragile X Syndrome"**

- The investigation into auditory hypersensitivity and processing deficits in a rat model of Fragile X Syndrome provides crucial insights into sensory abnormalities associated with neurodevelopmental disorders. By utilizing preclinical models, this research elucidates the neural mechanisms underlying sensory processing deficits in ASD-related conditions, offering a platform for the development of targeted interventions to alleviate sensory symptoms in individuals with Fragile X Syndrome and potentially other neurodevelopmental disorders.

- **S42.4 Ourania Semelidou (Inserm, Bordeaux, France): "Altered detection of tactile stimuli in a mouse model of autism during a translational task"**

    - The study on altered detection of tactile stimuli in a mouse model of autism during a translational task bridged preclinical research with clinical observations. By investigating tactile sensory processing in a mouse model of autism, this research offered translational insights into the sensory abnormalities observed in individuals with ASD. This work contributed to our understanding of the neurobiological basis of sensory alterations in ASD and laid the foundation for the development of novel therapeutic strategies targeting sensory symptoms in individuals with autism.

S43 "Understanding the role of neuronal integrative processing through oligomeric receptor complexes in health and brain disorders"

- **S43.1 Fang Liu (University of Toronto, Canada): "Dual effects of α7nAChR-NR2A receptor complex on nicotine addiction and major depression"**

    - The research on the dual effects of α7nAChR-NR2A receptor complex shed light on the intricate relationship between nicotine addiction and major depression. By unraveling the mechanisms underlying the interplay of these receptor complexes, this work provided valuable insights into the neurobiological basis of co-occurring nicotine addiction and major depressive disorders, informing novel therapeutic approaches for addressing these comorbidities.

- **S43.2 Ramon Fores-Pons (University of Malaga, Malaga, Spain): "The mGlu5 receptor protomer-mediated dopamine D2 receptor trans-inhibition is dependent on the adenosine A2A receptor protomer: implications for Parkinson's disease"**

    - The investigation into the mGlu5 receptor protomer-mediated dopamine D2 receptor trans-inhibition, dependent on the adenosine A2A receptor protomer, offered significant implications for Parkinson's disease. This research elucidated the intricate interplay between these receptor complexes, providing insights into the pathophysiology of Parkinson's disease and potential targets for therapeutic intervention.

- **S43.3 Borroto-Escuela (Karolinska Institutet, Stockholm, Sweden): "Dysfunctional serotonin heteroreceptor complexes as novel targets for the treatment of Major Depressive Disorders"**

- The study on dysfunctional serotonin heteroreceptor complexes as novel targets for the treatment of Major Depressive Disorders (MDD) highlighted promising avenues for MDD therapy. By targeting serotonin heteroreceptor complexes, this research opened new possibilities for the development of more effective and targeted treatments for MDD, addressing the need for innovative therapeutic approaches in psychiatry.

- **AWARDS & CONCLUSION**

CHAIRS: Olfa Masmoudi (TN), Taoufik Ghrairi (TN), and Giuseppe Di Giovanni (MT)

The awards presented recognize outstanding contributions to neuroscience research and innovation. These accolades signify the commitment of researchers worldwide to advancing our understanding of the brain and its disorders. We congratulate the recipients of the following prestigious awards; **Best Paper Awards:**

- **Journal Neuroscience Methods Elsevier**
- **CNS Neuroscience and Therapeutics Wiley**
- **The Receptors Springer/Nature**

- **Announcement MNS2025**

Looking ahead to future endeavors and collaborations, the announcement for MNS2025 anticipates continued progress in the field of neuroscience, fostering innovation, collaboration, and knowledge exchange among researchers, clinicians, and stakeholders.

Bright Minds and Bright Futures:

The hallmark of this conference was the vibrant and passionate attendees. Every professor who shared their research and answered questions contributed to the intellectual dynamism. The collective enthusiasm was indeed contagious. It's evident that the future of neuroscience is shining brightly, and being part of this journey is nothing short of exhilarating.

From Science to Culture: Embracing the Sights and Sounds:

Beyond the riveting conference sessions, attendees had the delightful opportunity to delve into the cultural riches of Tunisia. A visit to the enchanting Sidi Bou Said, often fondly referred to as the "Little Greece" for its striking resemblance to the Greek isles, left everyone with a sense of déjà vu as they explored its picturesque streets and azure horizons. A social dinner, accompanied by a captivating show, allowed participants to immerse themselves in the local culture and traditions, forging unforgettable memories. With the exciting news of the next MNS conference being hosted in Greece,

the anticipation for the next chapter of this intellectual and cultural journey is palpable. Get ready for more adventures and discoveries in a land where science and culture harmoniously intertwine!

A Journey of Learning, Growth, and Connection:

The conference facilitated both scientific exchanges and social interactions. Attendees had the opportunity to meet and interact with respected professors, which offered valuable intellectual stimulation and a rare chance to connect in person with mentors who have played significant roles in the field of neuroscience. Additionally, interactions with neuroscientists of varying experience levels highlighted the compatibility of brilliance with humility. Engaging conversations with fellow attendees, fostered a network of individuals with shared academic interests.

In conclusion, the MNS Conference 2023 was an opportunity to learn, grow, and connect with brilliant minds. It was a testament to the power of collaboration and knowledge sharing. As we move forward, let's continue pushing the boundaries of neuroscience and making a lasting impact on the world.

Stay tuned for more updates because, in the world of neuroscience, there are always more neuron high-fives on the horizon! 

Ibtihel Chatti -MSc Neuroscience and Biotechnology

MNS conference 2023 Moderator