Report on Pre-Conference Workshop on "Artificial Intelligence (AI) and Neurochemical Insights: From Model Systems to Real-World Neurochemistry"

The five-day pre-conference workshop on "Artificial Intelligence (AI) and Neurochemical Insights: From Model Systems to Real-World Neurochemistry," held at JSS College of Pharmacy, Mysuru from 11th to 15th November 2025, featured a comprehensive series of scientific and hands-on sessions integrating AI, neurochemistry, behavioural neuroscience, and advanced neuropharmacological techniques.

Day 1 introduced participants to the fundamentals of AI and machine learning under the guidance of Dr. Kumarapandiyan Gnanasegaran (Madras Christian College, Chennai), beginning with the inaugural address by Dr. Sulie L. Chang(Seton Hall University, USA) followed by sessions on AI/ML concepts and practical training in Python and R for neurochemical data analysis.

Day 2, led by experts Dr. Vikram Patil and Dr. Virupaksha (JSS Hospital, Mysuru), explored AI applications in neurochemistry, big-data analytics, predictive models for neurodegenerative disorders, drug discovery frameworks, and AI-driven neuroinflammation mapping, alongside discussions on ethics, DPDI Act compliance, neurobiological markers, and mental-health prediction tools.

Day 3, conducted by Dr. Saravana Babu C (JSS College of Pharmacy), focused on rodent behavioural paradigms for cognitive dysfunction, including the Morris Water Maze and Novel Object Recognition Test, followed by AI-based behavioural tracking using ANY-maze, emphasizing data accuracy, translational value, and ethical considerations.

Day 4 covered advanced neurodegenerative research techniques with demonstrations by Dr. Dithu Thekkekkara(JSS College of Pharmacy) on stereotactic surgery, sessions by Dr. Aishwarya Parameswaran(Eppendorf solutions)on live imaging modalities, and a lecture by Dr. Meena Sakharkar(University of Saskatchewan, Canada) on pharmacogenomics, fragment-based drug design, and computational approaches in precision medicine.

Day 5 featured Innovation Day with expert-led sessions, including psychiatric screening tools by Dr. M. Kishor(JSS Hospital, Mysuru), Explainable AI in healthcare by Dr. Mahanand B. S (Department of Information Science & Engineering, SJCE) medical image analysis innovations by Dr. Suresh Sundaram(IISc,Bangalore), and AI applications in

psychopharmacology by Dr. Swarna Buddha Nayok(NIMHANS), highlighting predictive modelling, drug-response mapping, and ethical considerations.

The five-day workshop successfully combined theory, hands-on training, and interdisciplinary insights across computational neuroscience, behavioural pharmacology, live imaging, ethics, AI-driven mental health tools, and precision medicine.

Participants gained practical exposure to AI applications in neurochemical research, behavioural analysis, imaging technologies, psychiatric screening, and drug development strengthening their capacity for advanced neuropharmacology research.

Dr. T. M. Pramod Kumar, Principal, JSS College of Pharmacy, Mysuru, extending a warm welcome to Dr. Sulie L. Chang, Distinguished University Research Professor and Director, Institute of Neuro-Immune Pharmacology (INIP), Seton Hall University, New Jersey, USA,

Inaugural lamp lighting ceremony marking the commencement of the Pre-Conference Workshop on "Artificial Intelligence (AI) and Neurochemical Insights: From Model Systems to Real-World Neurochemistry" by Dr. Sulie L. Chang, Distinguished University Research Professor and Director, Institute of Neuro-Immune Pharmacology (INIP), Seton Hall University, USA; From left to right: Dr. Dithu Thekkekkara, Dr. Nagashree K. S., Dr. K. L. Krishna, Dr. S. N. Manjula, Dr. Sulie L. Chang, Dr. T. M. Pramod Kumar, Dr. Kumarapandiyan Gnanasegaran, Dr. Saravana Babu Chidambaram, Dr. Seema Mehdi, and Mrs. Ambika M. S.

Dr. Kumarapandiyan Gnanasegaran, Assistant Professor, Department of Statistics, Madras Christian College, Chennai, delivering the first session of the pre-conference workshop on "Foundations of AI & ML in Neuroscience Research"

AI in Brain Health" session led by Dr. Vikram Patil at , JSS College of Pharmacy, Mysuru, Karnataka. The event, held on November 12, 2025, focuses on ethical considerations and

challenges in applying artificial intelligence to neuroscientific research, with discussions on data privacy, security, and bias in medical datasets.

"AI in Mental Wellbeing: Neurobiological Changes and Scope in Future" *session led by* Dr. Virupaksha at *JSS College of Pharmacy, Mysuru, Karnataka*. *The event, held on* November 12, 2025**,** *explored the integration of Artificial Intelligence in psychiatry and mental well-being.*

Dr. Saravana Babu C delivered an insightful and interactive session on "Overview of Rodent Behavioural Models for Cognitive Dysfunction." The talk integrated theoretical concepts with practical demonstrations, outlining key paradigms such as the Morris Water Maze, Radial Arm Maze, T-Maze, and Novel Object Recognition Test. He emphasized their

significance in assessing learning, memory, and cognitive deficits, as well as in evaluating neuroprotective compounds.

Demonstration of Morris Water Maze (MWM)

Hands-on session on video tracking and behavioural analysis using the AI-based software ANY-maze, conducted as part of the pre-conference workshop at JSS College of Pharmacy, Mysuru

Participants observed the practical handling of the stereotactic frame, coordinate alignment, and surgical workflow by Dr. Dithu as part of the Day 4 pre-conference workshop held on 14 November 2025.

The afternoon session featured a hands-on demonstration on live animal imaging conducted by Dr. Aishwarya Parameswaran, application manager, Eppendorf solutions introducing participants to essential in vivo imaging technologies used in translational neuropharmacology.

Dr. Aishwarya Parameswaran provided a demonstration of in vivo imaging systems and their applications in translational neuropharmacology.

Dr. Meena Sakharkar engaging participants during her lecture on advanced pharmacogenomics and modern drug development trends.

Session on Explainable Artificial Intelligence for Healthcare delivered by Dr. Mahanand B. S., Associate Professor, SJCE. Demonstration of XAI tools for interpretable clinical decision-support systems.

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Lecture on AI-based medical image analysis by Dr. Suresh Sundaram, IISc Bangalore, highlighting deep-learning innovations in MRI, CT, ultrasound, and histopathology diagnostics.

Session on AI in Psychopharmacology by Dr. Swarna Buddha Nayok, Assistant Professor, NIMHANS, discussing predictive treatment algorithms and personalized drug-response modeling.

Valedictory Function