



Pawan Kumar
Scientist-I
Department of NMR
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Research Area:

My research focuses on in vitro NMR spectroscopy-based metabolomics of biological samples, including tissues, blood, urine, biopsy specimens, cells, and medicinal plant materials. We investigate biochemical pathways and disease-associated metabolic alterations. By developing and optimising advanced 1D and 2D NMR methodologies, our aim is to improve the detection, characterisation, and interpretation of disease-related metabolic changes, thereby contributing to a deeper understanding of disease mechanisms and biomarker discovery.

Professional Experience:

2007-2008: Project work in the Biotechnology Lab. Jamia Millia Islamia University New Delhi.

2008-2009: Research fellow (PhD work), University of Delhi.

2009-2009 (Oct): Research fellow (PhD work), in Post Graduate Studies and Research, M.H.H. College, CCS University, Meerut (U.P).

2009(Oct) onward: Scientist-I, Department of NMR, All India Institute of Medical Sciences, New Delhi.

Education:

M.Sc. Biotechnology, Jamia Millia Islamia (a Central University New Delhi) India.

Professional Memberships:

1. Indian Biophysical Society
2. NMR Society
3. International Society for Magnetic Resonance in Medicine (ISMRM)
4. ISMRM- Indian chapter

Research Project:

1. Immunomodulatory effects, protease inhibitory activity and spectroscopic characterization of select ayurvedic prophylactics and formulations: In vitro studies for novel SARS CoV infections"
2. Serum and Saliva Metabolomic Profiling and Identification of Potential Biomarkers in Periodontitis by Nuclear Magnetic Resonance Spectroscopy.
3. Metabolomic fingerprinting to identify serum metabolites in patients with heart valve diseases using 1H-NMR spectroscopy.
4. Metabolic profiling of prostate cancer to identify biomarkers using Nuclear Magnetic Resonance Spectroscopy and Mass spectrometry.
5. To evaluate and determine the effect of areca nut extracted in Rat models using MR imaging and NMR metabolomic.

Research publication:

1. Monalisa Tiwari, **Pawan Kumar**, Kiran Kumar Tejavath, Vishvanath Tiwari. Assessment of Molecular Mechanism of Gallate- Polyvinylpyrrolidone-Capped Hybrid Silver Nanoparticles against Carbapenem-Resistant *Acinetobacter baumannii*. *ACS Omega*, 5: 1206–1213, 2020.
2. Ritu Tyagi, **Pawan Kumar**, and Uma Sharma. Metabolomics techniques: A brief update. Epigenetics and Metabolomics, Translational Epigenetics Series; (Ed. Paban K. Agrawala, Poonam Rana). *Elsevier* (2021); Vol. 28, p 1-19.
3. Apoorva Challa, Uma Sharma, Ritu Tyagi, **Pawan Kumar**, Seema Sood, Garima Kachhawa, Naranamangalam R. Jagannathan, and Somesh Gupta. Predictive Performance of H-NMR Metabolomics-Derived Biomarkers of Bacterial Vaginosis. *Sexually Transmitted Diseases*, Volume 51, Number 2, February 2024.
4. Thokchom SD, Gupta S, Mewar SK, **Kumar P**, Kalra C, Kapoor R. Metabolome profiling of arbuscular mycorrhizal fungus treated *Ocimum tenuiflorum* L. provides insights into deviation in allocation of carbon compounds to secondary metabolism. *Plant Physiol Biochem.* 2023 Sep 13; 203:108039. doi: 10.1016/j.plaphy.2023.108039. Epub ahead of print. PMID: 37717347
5. Thokchom Sarda, **Pawan Kumar**, Sujeet Kumar Mewar, and Rupam Kapoor. Metabolome profiling based on NMR spectroscopy and GC-MS of Holy basil showed positive influence of arbuscular mycorrhizal fungi on medicinally important compounds. *The 5TH Annual Scientific Meeting of the Asian Society of Magnetic Resonance in Medicine (ASMRM)*, August 2023, New Delhi, India.
6. S Ghatak, PK Rai, **P Kumar**, S Mewar, R Jayasundar. NMR Metabolomics in Validating Traditional Indian Medicine Classification of Medicinal Plants. *54th Experimental Nuclear Magnetic Resonance Conference*, USA, 54: 16, 2013.
7. S Ghatak, PK Rai, **P Kumar**, S Mewar, R Jayasundar. Role of NMR metabolomics in validating ayurvedic classification of medicinal plants. *Nuclear Magnetic Resonance Society*, IIT, Bombay, P17, 2013.
8. S Ghatak, E Kaur, **P Kumar**, S Mewar, PK Rai, T Velpandian, R Jayasundar. Spectroscopic analysis and antioxidant evaluation of medicinal plants. *Nuclear Magnetic Resonance Society*, IIT, Bombay, P43 2013.
9. V Kumar, **P Kumar**, U Sharma, T C Nag, N R Jagannathan, S Wadhwa. Altered Metabolism in the Developing Auditory Cortex of Chicks Exposed to Chronic High Decibel Noise: A ¹H NMR-based Metabonomic study. *21st Annual Meeting of ISMRM (International Society for Magnetic Resonance in Medicine)*, Salt Lake city, Utah, USA (2013)
10. Pandav Kumud, Sharma Shweta, Gupta Surendra Prakash, Mewar Sujeet, **Kumar Pawan**, Jagannathan NR. and Kumar Surat: 2D Proton NOESY A Tool for Determination of Solution Conformation an A basic Lesion. *National conference on Recent Trends in Chemical and Environmental Sciences- RTCES-2013-2014*.
11. Virendra Kumar, **Pawan Kumar**, Khushpreet Singh, N R Jagannaathan and Ajeet Kumar. Urinary ¹H NMR-based Metabolomics can Distinguish Sub-fertility Buffalo Bulls. *Proc. Intl. Soc. Mag. Reson. Med.*, 1584: 30 May – 5 June 2015, Toronto, Canada.
12. Virendra Kumar, **Pawan Kumar**, Khushpreet Singh, NR Jagannathan, Ajeet Kumar. Sub-fertility in Buffalo bulls identified by NMR-based metabolomics of Urine. *Intl. Conf. on Recent Trends in Agriculture, Veterinary & Life Sciences*, Jan 30 – 31, 2015, Vikram University, Ujjain.
13. **Pawan Kumar**, Rahul Kumar, Sujeet Mewar, Dimpy Gupta, Aditya Kumar Gupta, Sameer Bakhshi, Pranay Tanwar, Virendra Kumar. Metabolic Biomarkers in Bone Marrow of Childhood Acute Lymphoblastic Leukemia. *Nuclear Magnetic Resonance Society*, INSA, New Delhi, 2019.
14. **Pawan Kumar**, Rahul Kumar, Sujeet Mewar, Dimpy Gupta, Aditya Kumar Gupta, Sameer Bakhshi, Pranay Tanwar, Virendra Kumar. NMR based Metabolomics Study of Blood Plasma of Acute Lymphoblastic Leukemia. *Nuclear Magnetic Resonance Society*, INSA, New Delhi, 2019.
15. Virendra Kumar, **Pawan Kumar**, Rahul Kumar, Sujeet Mewar, Dimpy Gupta, Aditya Kumar Gupta, Sameer Bakhshi, Pranay Tanwar. Metabolic Profile Changes after Therapy in Childhood Acute Lymphoblastic Leukemia Studied by NMR. *Nuclear Magnetic Resonance Society*, INSA, New Delhi, 2019.
16. Virendra Kumar, **Pawan Kumar**, Dimpy Gupta, Rahul Kumar, Sujeet Mewar, Aditya Kumar Gupta, Sameer Bakhshi⁴, Pranay Tanwar. Bone Marrow Metabolomics of Acute Myeloid Leukemia. *Nuclear Magnetic*

17. Sujeet Mewar, Dimpy Gupta, Rahul Kumar, **Pawan Kumar**, Aditya Kumar Gupta, Sameer Bakhshi, Pranay Tanwar, Virendra Kumar. Blood Plasma Shows Metabolic Changes in Patients of Acute Myeloid Leukemia studied by NMR Metabolomics. *Nuclear Magnetic Resonance Society*, INSA, New Delhi, 2019.
18. **Pawan Kumar**, Virendra Kumar, Sambhunath Das, Punya Toya Bej. NMR Metabolomics Study of Blood during Cardiopulmonary Bypass for Heart Surgery. *NMRS (National Magnetic Resonance Society Meeting & International Conference on NMR)*, Gujarat, India. P55, 2020.
19. **Pawan Kumar**, Uma Sharma R Narang, Sujeet Mewar. Metabolic changes in coronary artery disease assessed using ¹H NMR Metabolomics. *International Society for Magnetic Resonance in Medicine (ISMRM)*, 15-20 May 2021. (Virtual Meeting).
20. Pradeep Kumar, **Pawan Kumar**, Anika Dawar, Virendra Kumar. Metabolic Profiling of Saliva Reveals Potential Biomarker/s of Periodontitis. *Nuclear Magnetic Resonance Society (NMRS)*, IIT Gandhinagar, Gujarat March 6th -9th 2022.
21. Ashu Bhasin, **Pawan Kumar**, S Senthil Kumaran, Sujeet Mewar, and MV Padma Srivastava. Neurogenic metabolites after intravenous autologous stem cells infusion in Stroke: a high-resolution NMR spectroscopic analysis of human sera. *Intl Soc Magn Reson Med (ISMRM)*, May 2022. London, UK
22. Ashu Bhasin, **Pawan Kumar**, S Senthil Kumaran, Sujeet Mewar, and MV Padma Srivastava. HNMR Spectroscopic Profiling of Human Sera After Autologous Stem Cell Infusion. *14th Stroke Congress*. June 2022, Singapore.
23. Dawar Anika; Kumar Virender; **Kumar Pawan**; Kumar Pradeep. Saliva metabolomic profiling and identification of potential biomarkers in periodontitis by nuclear magnetic resonance spectroscopy. *46th National conference of Indian society of Periodontology*. November 2022. Bhubaneswar, Odisha, India
24. Dawar Anika; Kumar Virender; **Kumar Pawan**; Kumar Pradeep. Metabolomic Profiling in Periodontitis using Proton NMR. P. Rajasekar, Rajiv Narang, Sujeet Kumar Mewar, Sudheer K. Arava, Rama Jayasundar H-NMR Based Serum Metabolic Profiling Highlights Different Specific Metabolites between Heart Valve Diseases Patients and Healthy Controls. *92nd Annual Meeting of Society of Biological Chemist*, December 2023. Goa, India.
25. **Pawan Kumar**, Sujeet Kumar Mewar, P. Rajasekar, Rajiv Narang, Pradeep Kumar, Uma Sharma, Sudheer K. Arava, Rama Jayasundar. Serum Metabolomics Study of Patients with Heart Valve Disease using NMR spectroscopy. *SCANMR*, February 2024. Lucknow, India
26. **Pawan Kumar**, Pradeep Kumar, Rajeev Narang, Sujeet Kumar Mewar, Sudheer Kumar Arva, Sandeep Chakraborty, Rama Jayasundar and Palleti Rajashekar. Serum metabolic profiling of human valve diseases based on proton NMR spectroscopy. *Intl Soc Magn Reson Med (ISMRM)*, May 2024, Singapore.
27. Palleti Rajashekar, **Pawan Kumar**, Rajeev Narang, Sujeet Kumar Mewar Pradeep Kumar Sandeep Chakraborty Sudheer Kumar Arva, Rama Jayasundar. Tissue Metabolomics Characterization of Human Valve Diseases using NMR spectroscopy, *Intl Soc Magn Reson Med (ISMRM)*, May 2024, Singapore.

