



PAYAL SANJAYRAO MATE

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Researcher leveraging both data-driven and experimental approaches to explore molecular mechanisms in biological systems. Working in genomics, transcriptomics, and proteomics, with a focus on uncovering disease mechanisms and therapeutic targets. Proficient in high-throughput data analysis and molecular biology techniques.

TECHNICAL SKILLS

Computational Techniques

- Molecular docking and modelling (Gromacs, Autodock Vina, Discovery Studio, SPDBV)
- NGS Data Processing: FastQC, Trimmomatic, BWA, Samtools, RNA-Seq (DESeq2, Seurat)
- Pathway & network analysis (STRING, Reactome, Cytoscape)
- GraphPad Prism, ImageJ, MS Office, LaTeX
- R programming

Wet Lab Techniques

- DNA/RNA extraction, protein extraction, qPCR, Western blotting
- Cell culture (HepG2, Hepa 1-6, 3T3-L1, MCF-7)
- ELISA, Immunohistochemistry, Oil-o-red staining
- Confocal microscopy
- Cell viability and cytotoxicity assays

RESEARCH AREAS OF INTEREST

Protein Expression, Genomics, Bioinformatics, Computational Biology.

CURRENT RESEARCH

Development of potential inhibitors through Deep Learning for the treatment of breast cancer

RESEARCH EXPERIENCE

Ph. D. Research

- Designed and executed experiments to investigate the localization and expression of aquaporins in bovine liver and adipose tissue using **immunohistochemistry, western blotting, and RT-PCR**.
- Performed **protein extraction, SDS-PAGE, cell culture, and confocal microscopy**.
- Analyzed experimental data using statistical tools, bioinformatics software, and lab-based analysis platforms to derive insights.
- Optimized protocols and assays to ensure accuracy, reproducibility, and efficiency in experimental workflows. Also maintained comprehensive lab records and prepared reports and presentations to communicate findings effectively.
- Performed docking studies using AutoDock Vina, and PyRx to evaluate inhibitor binding affinity and pose prediction. Also Performed simulations of protein–ligand complexes with **GROMACS**, analyzing RMSD, RMSF, hydrogen bonding, and interaction energy profiles.

EDUCATION

- **Ph.D.** in Animal biochemistry (Pursuing)
National Dairy Research Institute, Karnal, HR, India.
- **M.Sc.** in Biochemistry (2019)
G. B. Pant University of Agriculture and Technology, Pantnagar, UK, India.
- **B.Sc.** in Biotechnology (2017)
Shri Shivaji College of Agriculture Biotechnology, Amravati, MH, India.

PUBLICATIONS

- **Payal S. Mate**, Fathima Jasmin A. T., Anju Nagpal, Suneel Kumar Onteru, Ashutosh, Sunita Meena “[Expression and Immunolocalization of Aquaporins in the Buffalo Liver and Adipose Tissue](#),” (Journal of molecular histology, 2025).
- Shiveeli Rajput, Devika Gautam, Ashutosh Vats, Mayank Roshan, Priyanka Goyal, Chanchal Rana, **Payal S. Mate**, Ashutosh Ludri, Sachinandan De “[Aquaporin \(AQP\) gene family in Buffalo and Goat: Molecular characterization and their expression analysis](#)” (International Journal of Biological Macromolecules, 2024).
- Anjali Jaglan, Gunjan Sadara, Anju Nagpal, **Payal S. Mate**, Sudarshan Kumar, Gunjan Goel “Protective effects of probiotic mediated digested gliadin and 33-mer peptide in Caco-2 cell cultures” (under review).
- **Payal S. Mate**, Fathima Jasmin A. T., Ashutosh, Sunita Meena “Effect of the Seasons on the Expression of Aquaporins in the Bovine Liver and Adipose Tissue” (under preparation).
- **Payal S. Mate**, Fathima Jasmin A. T., Suman Rani, Ashutosh, Sunita Meena “In Vitro Assessment of Zingerone as an Aquaporin 9 Inhibitor” (under preparation).
- **Payal S. Mate**, Vivek C. Verma, Sanjeev Agrawal, Jai Prakash Jaiswal, Venugopalan Visha Kumari, Rajeev Kumar, Mala Kumari, Ahmed Gaber, Akbar Hossain “[Effect of Fenugreek \(*Trigonella foenum-graecum* L.\) Seed Extract on Glycaemic Index, in vitro Digestibility and Physical Characterization of Wheat \(*Triticum aestivum* L.\) Starch](#)” (Journal of Food Science, 2024).

NUCLEOTIDE SEQUENCES SUBMITTED TO NCBI

Accession numbers: ON456448, ON456449, ON456450, ON456451, ON456452, ON456453, ON456454, ON456455, ON456456, ON456457, ON456458, ON456459, ON456460, ON456461, ON456462, ON456463, ON456464.

AWARDS/ FELLOWSHIPS

- Received Best Scientific Story Award by Augmenting Writing Skills for Articulating Research-Department of Science and Technology, India (AWSAR-DST) (2023)
- Junior Research Fellow by the Department of Biotechnology (DBT), Government of India (2020).
- Qualified ICMR-JRF examination by the Indian Council of Medical Research in life sciences (2020).
- Qualified the joint CSIR-UGC TEST by the Council of Scientific and Industrial Research, India (2018).
- Qualified ICAR NET examination by Indian Council of Agricultural Research (ICAR) (2018).
- Received National Talent Scholarship (NTS) during M.Sc. (2017-2019).

CONFERENCES ATTENDED

- Attended 1st MENA Congress for Clinical and Translational Research 2025, **Abu Dhabi, UAE**.
- Presented poster in an international conference organized by **Proteomics society of India 2024**.
- Received best paper presentation award at the international conference **AAVASILES 2022**.
- Held the third position in poster presentation in a symposium organized by the Society of Biological Chemists (India) (**2018**).
- Participated and presented research project at 11th Maharashtra State-Inter University Research Convention (**AVISHKAR-2017**).

WORKSHOPS ATTENDED

- Participated in an international workshop focused on AI and Machine Learning applications in Drug Discovery.
- Gained practical experience in R programming applied to biological data analysis.
- Completed experimental training in next-generation sequencing (NGS), RNA-Sequencing & Transcriptome Analysis).
- Gained practical experience through a hands-on workshop in molecular docking and protein modelling.



TEACHING EXPERIENCE

- Conducted laboratory classes for graduate level course “biochemical techniques” (2020-21) in a division of Animal Biochemistry at National Dairy Research Institute, Karnal, India.
- Conducted laboratory classes for graduate level course “molecular biology” (2021-22) in a division of Animal Biochemistry at National Dairy Research Institute, Karnal, India.