

Priyanka Mehta, PhD

Bioinformatician

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Research Interests

- **Multimodal-Omics Predictive Modeling:** Develop biologically-informed ML frameworks to integrate (long-read) genomic and transcriptomic profiles with clinical metadata that explain variation in disease susceptibility and severity.
- **Single-Cell Omics Investigations:** Investigate alternative splicing at single-cell resolution to link cell-type specific splicing regulation modulating infectious disease severity.
- **Ancient & Evolutionary Genomics:** Leveraging archaic and modern DNA for comparative understanding of expansion of coding capacity and co-evolution of host and viral pathogens; and their impact on human health and disease.

Education

2021-2025	PhD in Biological Sc.	CSIR-Institute of Genomics and Integrative Biology, Delhi.
2019	M.Sc. Bioinformatics	Pondicherry University, Puducherry.
2017	B.Sc. Microbiology	Scottish Church College, Calcutta University, West Bengal.

Core Skills

Computational Skills

Proficient in a wide range of methods and tools, with the following representing a core subset of my skills:

- **Programming & Scripting:** R (RStudio), Python, Bash/Shell scripting, HTML/CSS, Streamlit (web application development),
- **Bioinformatics Algorithms & Pipelines:** Basecallers (bcl2fastq, Guppy, Dorado), Splicing analysis (LeafCutter, rMATS), RNA quantification (Salmon, STAR), genome alignment (Bowtie, HISAT, BWA-MEM, minimap2), quantification (featureCounts), translation analysis (ribotricer), pathway enrichment (fgseaR, enrichR), eggNOG, Differential transcript usage analysis (IsoformSwitchAnalyzeR, DRIMseq, DEXseq), Differential expression (DESeq2, fishpond, Noiseq), splicing QTL analysis (QTLTools), single-cell analysis (seurat, cellranger, UMItools), mutli-omic microbiome analysis (qiime2, kraken2, DADA), phylogeny (MAFFT, fasttree, figtree), assemblers (Flye, Medaka), variant calling (Sniffles, cuteSV), quality control & Post-processing (samtools, bcftools, tabix, VCFtools), variant annotation (snpEff)
- **Data Visualization & Statistics:** ggplot2, circlize, ComplexHeatmap, bnlearn, cytoscape, inkscape, Graphpad, gviz, GenomicRanges, RtrackerViewer, KaryoplotR, vcfR
- **HPC & Workflow Management:** Slurm (HPC), Snakemake, Nextflow, Docker
- **Custom Dashboard Development:** Built a Streamlit-based In-House Dengue Genome Surveillance Dashboard (<https://denviewer.streamlit.app/>)

Genomic and Transcriptomic Expertise

- Bulk and single-cell RNA-seq
- Long-read Viral and human Whole genome sequencing (WGS)
- Long-read RNA sequencing (Oxford Nanopore)
- 16S rRNA and metagenomics analysis
- Riboseq data analysis

NGS Platforms

- **Illumina:** NovaSeq6000, NextSeq2000, MiSeq
- **Oxford Nanopore Technologies:** Mk1B, Mk1C, GridION, P2Solo
- **Element Biosciences:** AVITI

Operating Systems

- Linux (Ubuntu), Windows

Work Experience

Jan 2022-Aug 2022	Data Analyst with Dr Rajesh Pandey, CSIR-Institute of Genomics and Integrative Biology (IGIB), New Delhi, India. <i>COVID-19: Enhance Genomic Surveillance & Genetic Epidemiology of SARS-CoV- 2 in India.</i>
Sept 2020-Oct-2021	Project Associate-I with Dr Rajesh Pandey, CSIR-Institute of Genomics and Integrative Biology (IGIB), New Delhi, India. <i>Biomedical analysis and bioinformatics within the Integrative GENomics of COVID-19 (INGEN-CoV2) research program.</i>
Jan 2019- May 2019	Master's Degree research with Dr P.T.V. Lakshmi, Centre for Bioinformatics Pondicherry University, Puducherry, India. <i>Association Rule Mining approach to identify the correlation between organoleptic properties and bioactivities of phytochemicals.</i>
May 2018 -July 2018	Internship with Dr Sudipto Saha, Bose Institute, Kolkata, West Bengal, India <i>Distinguish Obstructive Airway Disease like COPD and Asthma by Machine Learning algorithmic analysis of HR CT-scans.</i>
Dec 2017- Jan 2018	Internship with Dr Sayak Ganguli at The Biome, West Bengal, India. <i>Computational Gene identification from HIV-1 virus genome and Designing Antisense siRNA against them.</i>

Publications (ORCID: 0000-0001-6298-4322) (* contributed equally)

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1. **Mehta P***, Liu CSC*, Sinha S, Mohite R, Arora S, Chattopadhyay P, Budhiraja S, Tarai B, Pandey R. *Reduced protein-coding transcript diversity in severe dengue emphasises the role of alternative splicing.* **Life Science Alliance.** 2024 Aug 1;7(8).
 2. **Mehta, P.***, Devi, P.*, Budhiraja, S., Tarai, B. and Pandey, R., 2025. *Suboptimal dengue genome leverages non-canonical translation mechanisms.* **iScience.**
 3. **Mehta P**, Chattopadhyay P, Mohite R, D'Rozario R, Bandopadhyay P, Sarif J, Ray Y, Ganguly D, Pandey R. *Suppressed transcript diversity and immune response in COVID-19 ICU patients: a longitudinal study.* **Life Science Alliance.** 2024 Jan 1;7(1).
 4. **Mehta P***, Chattopadhyay P*, Ravi V, Tarai B, Budhiraja S, Pandey R. *SARS-CoV-2 infection severity and mortality is modulated by repeat-mediated regulation of alternative splicing.* **Microbiology Spectrum.** 2023 Oct 17;11(5):e01351-23.
 5. Chattopadhyay P*, **Mehta P***, Soni J, Tardalkar K, Joshi M, Pandey R. *Cell-specific housekeeping role of lncRNAs in COVID-19-infected and recovered patients.* **NAR Genomics and Bioinformatics.** 2024 Mar 1;6(1):lqae023.

6. **Mehta P***, Ravi V*, Devi P, Maurya R, Parveen S, Mishra P, Yadav A, Swaminathan A, Saifi S, Khare K, Chattopadhyay P. *Mutational dynamics across VOCs in International travellers and Community transmission underscores importance of Spike-ACE2 interaction.* **Microbiological research.** 2022 Sep 1;262:127099.
7. Yadav S*, **Mehta P***, Soni J*, Chattopadhyay P*, Devi P, Habyarimana T, Tardalkar K, Joshi M, Pandey R. *Single-cell RNA-Seq reveals intracellular microbial diversity within Immune cells during SARS-CoV-2 Infection and Recovery.* **iScience.** 2023 Oct 30.
8. Soni, J.*, **Mehta, P.***, Yadav, S., Chattopadhyay, P. and Pandey, R., 2025. *Protocol for investigating intracellular microbial diversity using single-cell RNA-seq in immune cells of SARS-CoV-2-positive and recovered patients.* **STAR protocols**, 6(1), p.103546.
9. Sinha BP*, **Mehta P***, Hoque MA, Bandopadhyay P, Nandi A, Saha I, Nandi Mitra A, Mondal A, Bhattacharjee B, Chamilos G, Pandey R. *Deficient Phagocytosis in Circulating Monocytes from Patients with COVID-19-Associated Mucormycosis.* **Mbio.** 2023 Apr 13:e00590-23.
10. **Mehta P***, Yadav M*, Ahmed V*, Goyal K, Pandey R, Chauhan NS. *Culture-independent exploration of the hypersaline ecosystem indicates the environment-specific microbiome evolution.* **Frontiers in Microbiology.** 2021 Oct 28;12:686549.
11. Devi P*, Maurya R*, **Mehta P***, Shamim U*, Yadav A, Chattopadhyay P, Kanakan A, Khare K, Vasudevan JS, Sahni S, Mishra P. *Increased abundance of *Achromobacter xylosoxidans* and *Bacillus cereus* in upper airway transcriptionally active microbiome of COVID-19 mortality patients indicates role of co-infections in disease severity and outcome.* **Microbiology Spectrum.** 2022 Jun 29;10(3):e02311-21.
12. **Mehta P***, Sahni S*, Siddiqui S*, Mishra N*, Sharma P, Sharma S, Tyagi A, Chattopadhyay P, Vivekanand A, Devi P, Khan A. *Respiratory co-infections: modulators of SARS-CoV-2 patients' clinical sub-phenotype.* **Frontiers in Microbiology.** 2021:1268.
13. Kanakan A*, **Mehta P***, Devi P, Saifi S, Swaminathan A, Maurya R, Chattopadhyay P, Tarai B, Das P, Jha V, Budhiraja S. *Clinico-Genomic Analysis Reiterates Mild Symptoms Post-vaccination Breakthrough: Should We Focus on Low-Frequency Mutations?.* **Frontiers in Microbiology.** 2022 Mar 3;13:763169.
14. Jha N*, Hall D*, Kanakan A*, **Mehta P***, Maurya R, Mir Q, Gill HM, Janga SC, Pandey R. *Geographical landscape and transmission dynamics of SARS-CoV-2 variants across India: a longitudinal perspective.* **Frontiers in Genetics.** 2021 Dec 17;12:753648.
15. Chattopadhyay P*, Mishra P*, **Mehta P***, Soni J, Gupta R, Tarai B, Budhiraja S, Pandey R. *Transcriptomic study reveals lncRNA-mediated downregulation of innate immune and inflammatory response in the SARS-CoV-2 vaccination breakthrough infections.* **Frontiers in immunology.** 2022 Nov 18;13:1035111.
16. **Mehta, P.**; Alle, S.; Chaturvedi, A.; Swaminathan, A.; Saifi, S.; Maurya, R.; Chattopadhyay, P.; Devi, P.; Chauhan, R.; ... Pandey, R. *Clinico-Genomic Analysis Reveals Mutations Associated with COVID-19 Disease Severity: Possible Modulation by RNA Structure.* **Pathogens** 2021, 10, 1109.
17. **Mehta P**, Swaminathan A, Yadav A, Chattopadhyay P, Shamim U, Pandey R. *Integrative genomics important to understand host–pathogen interactions.* **Briefings in Functional Genomics.** 2022 Jul 30:elac021. (review article)

18. Sarif J, Raychaudhuri D, D’Rozario R, Bandopadhyay P, Singh P, **Mehta P**, Hoque MA, Sinha BP, Kushwaha M, Sahni S, Devi P. *Plasma gradient of soluble urokinase-type plasminogen activator receptor is linked to pathogenic plasma proteome and immune transcriptome and stratifies outcomes in severe COVID-19.* **Frontiers in Immunology.** 2021 Oct 28;12:738093.
19. Kapoor, S., **Mehta, P.**, Patial, V., Pandey, R. and Padwad, Y.S., 2025. *Phloretin induced modulation in gut microbiome, mitigates colonic inflammation and alleviates colitis-associated colorectal cancer in mice.* **Computational and Structural Biotechnology Journal.**
20. Devi P, Khan A, Chattopadhyay P, **Mehta P**, Sahni S, Sharma S, Pandey R. *Co-infections as modulators of disease outcome: minor players or major players?.* **Frontiers in Microbiology.** 2021 Jul 6;12:664386.
21. Dhar MS, Marwal R, Vs R, Ponnusamy K, Jolly B, Bhoyar RC, Sardana V, Naushin S, Rophina M, Mellan TA, Mishra S... **Mehta P.** *Genomic characterization and epidemiology of an emerging SARS-CoV-2 variant in Delhi, India.* **Science.** 2021 Nov 19;374(6570):995-9.
22. Shastri J, Parikh S, Aggarwal V, Agrawal S, Chatterjee N, Shah R, Devi P, **Mehta P**, Pandey R. *Severe SARS-CoV-2 breakthrough reinfection with delta variant after recovery from breakthrough infection by alpha variant in a fully vaccinated health worker.* **Frontiers in Medicine.** 2021:1379.
23. Kale P, Gupta E, Bihari C, Patel N, Rooge S, Pandey A, Bajpai M, Khillan V, Chattopadhyay P, Devi P, Maurya R... **Mehta P** *Vaccine breakthrough infections by SARS-CoV-2 variants after ChAdOx1 nCoV-19 vaccination in healthcare workers.* **Vaccines.** 2021 Dec 31;10(1):54.
24. Alle S, Kanakan A, Siddiqui S, Garg A, Karthikeyan A, **Mehta P**, Mishra N, Chattopadhyay P, Devi P, Waghdhare S, Tyagi A. *COVID-19 Risk Stratification and Mortality Prediction in Hospitalized Indian Patients: Harnessing clinical data for public health benefits.* **PLoS One.** 2022 Mar 17;17(3):e0264785.
25. Maurya R, Mishra P, Swaminathan A, Ravi V, Saifi S, Kanakan A, **Mehta P**, Devi P, Praveen S, Budhiraja S, Tarai B. *SARS-CoV-2 mutations and COVID-19 clinical outcome: mutation global frequency dynamics and structural modulation hold the key.* **Frontiers in Cellular and Infection Microbiology.** 2022 Mar 21;12:245.
26. Maurya R, Shamim U, Chattopadhyay P, **Mehta P**, Mishra P, Devi P, Swaminathan A, Saifi S, Khare K, Yadav A, Parveen S. *Human-host transcriptomic analysis reveals unique early innate immune responses in different sub-phenotypes of COVID-19.* **Clinical and Translational Medicine.** 2022 Jun;12(6).
27. Chattopadhyay P, Mishra P, Khare K, Yadav A, **Mehta P**, Saifi S, Swaminathan A, Devi P, Parveen S, Tyagi A, Jha V. *LncRNAs harbouring regulatory motifs within repeat elements modulate immune response towards COVID-19 disease severity and clinical outcomes.* **Clinical and Translational Medicine.** 2022 Jul;12(7).
28. D’Rozario R, Raychaudhuri D, Bandopadhyay P, Sarif J, **Mehta P**, Liu CS, Sinha BP, Roy J, Bhaduri R, Das M, Bandyopadhyay S. *Circulating interleukin-8 dynamics parallels disease course and is linked to clinical outcomes in severe COVID-19.* **Viruses.** 2023 Feb 16;15(2):549.
29. Chhimwal J, Anand P, **Mehta P**, Swarnkar MK, Patial V, Pandey R, Padwad Y. *Metagenomic signatures reveal the key role of phloretin in amelioration of gut dysbiosis attributed to metabolic*

dysfunction-associated fatty liver disease by time-dependent modulation of gut microbiome. **Frontiers in Microbiology.** 2023;14.

30. Pandey, R., Soni, J., Chattopadhyay, P., **Mehta, P.**, Mohite, R., Tardalkar, K. and Joshi, M., *Dynamics of Whole Transcriptome Analysis (WTA) and Surface markers expression (AbSeq) in Immune Cells of COVID-19 Patients and Recovered captured through Single Cell Genomics.* **Frontiers in Medicine**, 11, p.1297001.
31. Chattopadhyay P, **Mehta P**, Kanika, Mishra P, Liu CSC, Tarai B, Budhiraja S, Pandey R, *RNA editing in host lncRNAs as potential modulator in SARS-CoV-2 variants-host immune response dynamics.* **iScience.** 2024 April 26.

Book chapters

1. Chattopadhyay P, **Mehta P**, Maurya R, Mishra P, Kumari M, Devi P, Khare K, Yadav A, Srivastava M, Shamim U, Pandey R. *Experimental repertoire to elucidate the functional landscape of host-pathogen interactome.* Genomic Surveillance and Pandemic Preparedness 2023 Jan 1 (pp. 227-266). **Academic Press.**
2. **Mehta P**, Pandey R. *Immunocompromised or Inter-individual Variabilities?. In Pathogens and Environmental Impact on Life Forms: Understanding Pathogens and Host Defence Mechanisms* 2024 Nov 30 (pp. 147-168). Cham: **Springer Nature Switzerland.**

Awards and Achievements

2019-2020	Scholarship for Meritorious Students, Pondicherry University.
2024	International Travel Support (ITS)-SERB
2024	Travel Bursary from Immunology Foundation
2024	RNA Society Research Presentation Fellowship
2025	CSIR Senior Research Fellowship (SRF-Direct)

Conferences/Workshop

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1. **International** Poster Presentation at RNA Society Annual Meeting 2024, United Kingdom (28 May, 2024 to 02 June, 2024)
 2. **National** Poster Presentation at "Genomics for Better Health" national symposium at University of Kashmir, Srinagar, September 2023.
 3. **National** Poster Presentation at 45th All India Cell Biology Conference International Symposium on Biology of Development and Disease, January 2023.
 4. **Workshop** Computational Biology Trainer for 1st Indo-Vietnam Hands-on Training Workshop on Genomic Surveillance and Pandemic Preparedness
 5. **Workshop** Computational Biology Trainer for 2nd Indo-Vietnam Hands-on Training Workshop on understanding AMR using Nanopore Technology

Certifications

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1. Tools and Techniques to Perform Molecular Modelling and Computer-Aided Drug Design (MMTT-2021), International Workshop, January 2021.
 2. Advanced Computer-Aided Drug Designing by Schrodinger, Biotechnika, Certificate, July 2019.

3. Big Data Analytics and Cloud Computing, Mr S.Sundara Pandian, Tandem Certification Centre, Tirunelveli. Certificate, September 2018.
4. Next Genomic Era-NGS: A Clinical Approach, Pondicherry University, DBT, Govt. of India, New Delhi, Two-day course, Certificate, March 2018.
5. Trends in Cancer Omics, Pondicherry University and ICMR, One day course, certificate, March 2018.
6. Network Biology, Dr Ganesh Bagler, Center for Computational Biology, IIIT, New Delhi. Certificate, February 2018.
7. Cross-talk in Omics, Centre for Bioinformatics, Pondicherry University, One day course, August 2017.

Co-curriculum

- **Academic Portfolio designed with streamlit (Cyberpunk 2077 themed) :** [Mehtamorphosis](#)
- **Bioinformatics Training & Compering @** Indo-Vietnam Hands-on Training Workshop on Sequencing Techniques.
- **Book Cover Design:** Genomic Surveillance and Pandemic Preparedness 2023 Jan 1 (pp. 227-266). Academic Press.
- **Magazine article:** Unlocking the secrets of alternative splicing: A tale of two isoforms (<https://pulse.igib.res.in/?p=3133>).
- **Avid Data visualisation enthusiast :** Took part in the 30 days chart challenge on twitter. Check them out at @PriyankaMMehta

Contact Details

✉ : priyanka.m@igib.in

Contact: (+91) 8420727949

Referees

- 1 **Name:** Dr. Rajesh Pandey, PhD
Principal Scientist, CSIR-Institute of Genomics and Integrative Biology, Delhi, India
Associate Professor, Academy of Scientific & Innovative Research (AcSIR), Ghaziabad, India.
Adjunct Faculty, International Institute of Information Technology (IIITH), Hyderabad, India
Email: rajeshp@igib.in ; rajeshp.igib@csir.res.in
- 2 **Name:** Dr. Dipyaman Ganguly, MBBS PhD PhD
Head of the Department, Professor of Biology, Ashoka University, Haryana, India.
Ex: Senior Principal Scientist, CSIR-Indian Institute of Chemical Biology, Kolkata, India.
Email: dipyaman.ganguly@ashoka.edu.in
- 3 **Name:** Dr NarSingh Chauhan, PhD
Assistant Professor, Maharishi Dayanand University (MDU), Rohtak, India.
Email: nschauhan@mdurohtak.ac.in