



# Dr. VIKAS SHARMA

Senior Bioinformatics Scientist,  
Eagle Genomics India LLP, Hyderabad, Telangana, India

Bioinformatics Genomics

NGS Machine Learning

Programming Multiomics

Peer Review Consultancy

R&D

## COMPETENCES

### Bioinformatics & Genomics

Expertise in analyzing and interpreting biological data.

### Data Analytics & Machine Learning

Harnessing algorithms and analytics for insights and predictions.

### Programming (Perl, Python & R)

Employing languages for specialized data task.

### Academic Engagement & Peer Review

Active participation, contribution, and quality control in academia

### Project Management & Consultancy

Leading projects, offering expert advice, and fostering collaboration

### Research & Development

Demonstrated success in innovating and pioneering advancements in the field

## CONTACT

[in](https://www.linkedin.com/in/drsharma) [tinyurl.com/drsharma](https://www.linkedin.com/in/drsharma)

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[G](https://github.com/vsmicrogenomics) [github.com/vsmicrogenomics](https://github.com/vsmicrogenomics)

## PROFILE

Ph.D. scientist in Bioinformatics and Genomics, merging a strong academic foundation with practical industry insights. Proficient in multi-omics analysis, data analytics, and machine learning, further bolstered by certifications in Python, R, Machine Learning, and Data Science. My portfolio boasts notable peer-reviewed publications in esteemed journals and books. Accumulating 4.5 years of combined postdoctoral and industry experience, my primary emphasis remains on research. Supporting students as a teaching assistant during doctoral and postdoctoral phases, I am an active member and contributor to professional academic societies, holding roles ranging from referee to editor for various journals. My dedication to R&D is further manifested through consulting roles and co-investigator positions for externally-funded projects, highlighted by several awards in Bioinformatics and Genomics.

## EXPERIENCE

### Senior Bioinformatics Scientist

Eagle Genomics India LLP, Hyderabad | Nov. 2023 - Present

- Researching and implementing advanced scientific algorithms based on complex network principles and machine learning, specifically for microbiome and genomic analyses, leading to the enhanced understanding of ecosystem impacts.
- Directing bioinformatics projects in microbial genomics and microbiome studies, focusing on the comprehensive analysis of (meta)genomics, RNAseq, metabolomics, and proteomics data.
- Innovating in data fabric technology for insightful interpretation of extensive microbiome and multi-omics datasets.
- Fostering scientific excellence and promoting new methodologies in bioinformatics and network science.
- Collaborating to turn bioinformatics research into practical wellness and environmental health insights.
- Steering strategic client partnerships, delivering tailored bioinformatics solutions.

### Bioinformatics Scientific Manager

Eagle Genomics India LLP, Hyderabad | June 2022 - Nov. 2023

- Led cutting-edge scientific methodologies to enhance understanding in ongoing microbiome and genomic research projects.
- Engaged in cross-disciplinary collaborations to innovate and refine methodologies tailored to current needs in microbial and genomic sciences.
- Synthesized challenges observed in genomic and microbial research into actionable research objectives and strategies.
- Conveyed advanced scientific findings and methodologies to interdisciplinary teams, ensuring the seamless integration of genomic insights into broader research projects.
- Led collaborative research initiatives with global academic teams, combining expertise for comprehensive insights in microbiome and genomic studies.

### Co-investigator

All India Institute of Medical Sciences (AIIMS), New Delhi | 2022 - 2024

- Consulting as a co-investigator on the research project titled "Understanding the impact of gut microbiome dysbiosis and metabolic alterations in the pathogenesis of early onset (EOCRC) Colorectal Cancer (CRC),"

## **Research Associate I**

**Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh| Dec 2020 - June 2022**

- Managed and established a sequencing facility specialized in Next-Generation Sequencing (NGS) and analytics, focusing on microbiology and clinical informatics applications; utilized advanced technologies including Illumina MiSeq and Oxford Nanopore MinION.
- Led extensive research initiatives focusing on genomic studies of multidrug-resistant pathogens, exploring host-pathogen interactions in necrotizing soft tissue infections, and developing rapid diagnostic methods for pathogens in undifferentiated febrile illnesses, thereby contributing significantly to infectious disease understanding and control.
- Employed advanced methodologies, including genomics, 16S metagenomics, and dual RNA-seq, to effectively achieve research objectives, enhancing our capabilities in pathogen identification, understanding infection mechanisms, and developing innovative diagnostic techniques.
- Taught specialized courses to Ph.D. students, covering topics like 'Applications of NGS in Clinical Microbiology' and 'Bioinformatics for Biologists'.

## **Senior Project Scientist**

**Indian Institute of Technology (IIT) Mandi, Mandi, Himachal Pradesh| Sep 2020 - Dec 2020**

- Engineered synthetic microbial consortia for biohythane production, applying multi-omics techniques, viz., genomics, transcriptomics, and metagenomics.
- Utilized in-house Illumina MiSeq and NextSeq platforms for various NGS applications.

## **Senior Project Scientist**

**Indian Institute of Technology (IIT) Mandi, Mandi, Himachal Pradesh| May 2019 - May 2020**

- Led the development of synthetic microbial consortia for biohythane production, leveraging multi-omics approaches such as genomics, transcriptomics, and metagenomics.
- Conducted assessments of seasonal variations in microbial communities at the sewage plant on the institutional campus of IIT Mandi, while also orchestrating 16S metagenomic analyses on domestic wastewater samples from CSIR-IICT Hyderabad to explore microbial dynamics at different phases of wastewater treatment.
- Carried out the comprehensive evaluation of microbial communities in samples from the CETP Baddi plant, which receives influent from various industrial sources in Baddi, renowned as the world's third-largest pharmaceutical hub, utilizing 16S metagenomics.
- Managed and operated a high-throughput NGS facility, overseeing data analytics and sequencing processes on Illumina platforms, including MiSeq and NextSeq.

## **Senior Research Fellow**

**Jaypee University of Information Technology (JUIT), Solan, Himachal Pradesh| Jan 2013 - Feb 2013**

- Contributed to the development of gene markers aimed at increasing seed oil content in *J. curcas*, employing advanced genetic techniques.
- Investigated the molecular basis of female flower development in *J. curcas*, with the goal of genetically improving its seed yield.

## **EDUCATION**

### **Ph.D. Bioinformatics and Genomics**

**Specialization: Next-generation Sequencing (NGS) Data Analysis**

**Indian Institute of Technology Mandi| 2013 - 2019, Mandi, Himachal Pradesh**

- Thesis: "Comparative Genomics Analyses of Selected Microbes with Open Pan-genomes Highlight Their Evolutionary Dynamics at Functional Level." Thesis Advisor: Prof. Tulika P. Srivastava.
- Engaged in a significant international collaboration alongside renowned professors: Prof. Dieter Jendrossek, Prof. Georg Sprenger (both from Universität Stuttgart, Germany), and Prof. Tilman Lamparter (Karlsruher Institut für Technologie, Germany).
- Achieved a CGPA of 8.5/10 with comprehensive coursework, including Bioinformatics Applications for System Analysis, Genomics, Metagenomics, Advanced NMR Spectroscopy: A Problem-Based Approach, DNA Nanotechnology, and Research Methodology.
- Honored with the HTRA Junior Research Fellowship (2013-2016) and Senior Research Fellowship (2016-2019) from the Ministry of Human Resource Development, Government of India.
- Served as a Teaching Assistant to undergraduate, postgraduate, and doctoral students for six years, contributing to courses such as Understanding Biotechnology and its Applications, Computation for Engineers, Data Structure and Algorithms, Introduction to Omics and Systems Analysis, Quantitative and Computational Biology, Computation for Engineers Lab, and Systems Biology Labor.
- Worked as a Class Room Committee Member, coordinating examination logistics and addressing student concerns related to examination.

## **Integrated B.Tech. – M.Tech. Biotechnology**

Lovely Professional University (LPU) | 2007 - 2012, Phagwara, Punjab

- Graduated with a CGPA of 7.6/10 in Biotechnology Engineering.
- Completed comprehensive coursework across 49 subjects in Biotechnology Engineering.
- Major in Microbial Enzyme Biotechnology
- Masters Dissertation: "Cellulase Production from Bacteria Isolated from the Soil of Rice Field." Dissertation Advisor: Dr. Sheelendra Mangal Bhatt. This research venture explored the potential of soil bacteria in cellulase enzyme production, a pivotal enzyme in the biofuel industry and other applications.

## **PUBLICATIONS**

### **Anaerobic Co-digestion of Food Waste, Bio-flocculated Sewage sludge, and Cow Dung in CSTR using E\_C2(Tx) Synthetic Consortia**

Thakur H#, Rashmi#, Verma N, [Sharma V](#), Kumar S, Powar S, Prakash T\$, Dhar A\$, Environ. Technol. Innov., 32, 103263 | 2023

### **Microbial cell-free DNA detection: non-invasive diagnosis of infectious diseases**

Kanaujia R#, [Sharma V](#)#, Prakash T, Indian J. Med. Microbiol., 46, 100433 | 2023

### **Can beta-lactamase resistance genes in anaerobic Gram-negative gut bacteria transfer to gut aerobes?**

Sood A, [Sharma V](#), Angrup A, Ray P, J. Antibiot. (Nature Publishing Group), DOI: 10.1038/s41429-023-00608-z | 2023

### **Direct diagnosis of scrub typhus by full-length 16S rRNA gene analysis using Oxford Nanopore sequencing**

Sharda SC, Bisht K, [Sharma V](#), Lakku PR, Bhatia MS, Sharma N, Biswal M | Int. J. Infect. Dis., DOI:10.1016/j.ijid.2022.10.040 | 2022

### **Comparative genomics reveals the evolution of antimicrobial resistance in *Bacteroides nordii***

[Sharma V](#), Sood A, Ray P, Angrup A | Microb. Pathog., 105811 | 2022

### **Colonization of the central venous catheter by *Stenotrophomonas maltophilia* in an ICU setting: an impending outbreak managed in time**

Kanaujia R, Bandyopadhyay A, Biswal M, Sahni N, Kaur K, Vig S, [Sharma V](#), Angrup A, Yaddanapudi LN, Ray P, Am. J. Infect. Control, S0196-6553(21)00709-4 | 2022

### **In silico functional and evolutionary analyses of the rubber oxygenases (RoxA and RoxB).**

[Sharma V](#), Mobeen F, Prakash T, 3 Biotech, 10, 376 | 2020

### **Comparative human gut microbiome analysis of Prakriti and Sasang Systems reveals functional level similarities in the constitutionally similar classes.**

Mobeen F, [Sharma V](#), Prakash T, 3 Biotech, 10, 379 | 2020

### **Functional signature analysis of extreme Prakriti endo-phenotypes in gut microbiome of western Indian rural population.**

Mobeen F, Sharma V, Prakash T, Bioinformation, 15, 490-505 | 2019

### **Exploration of survival-traits, probiotic-determinants, host-interactions, and functional evolution of bifidobacterial genomes using comparative genomics.**

[Sharma V](#), Mobeen F, Prakash T, Genes 9 (10), 477 | 2018

### **Enterotype variations of the healthy human gut microbiome in different geographical regions.**

Mobeen F, [Sharma V](#), Prakash T, Bioinformation, 14, 560-573 | 2018

### **Metabolic and taxonomic insights into the Gram-negative natural rubber degrading bacterium *Steroidobacter cummioxidans* sp. nov., strain 35Y.**

[Sharma V](#), Siedenburg G, Birke J, Jendrosseck D, Mobeen F, Prakash T | PLoS One 13(5), e0197448 | 2018

### **Western Indian rural gut microbial diversity in extreme Prakriti endo-phenotypes reveals signature species.**

Chuahans NS, Pandey R, Mondal AK, Gupta S, Kumar J, Patil R, Agarwal D, Girase B, Shrivastava A, Mobeen [Sharma V](#), Prakash T, Juvekar S, Prasher B, Mukerji M, Dash D, Front. Microbiol., 9 (2018): 118 | 2018

### **Characterization of *Phormidium lacuna* strains from the North Sea and the Mediterranean Sea for biotechnological applications.**

Nies F, Worner S, Wunsch N, Armant O, [Sharma V](#), Hesselschwerdt, A, Falk F, Weber, N, Weiß J, Trautmann A, Posten C, Prakash T, Lamparter T, Process Biochem., 59, 194-206 | 2017

### **Comparative genomics of Herpesviridae family to look for potential signatures of human infecting strains.**

[Sharma V](#), Mobeen F, Prakash T, Int. J. Genomics, 2016, 9543274 | 2016

### **Functional assignment of metagenomic data: insights for the microbial nitrogen cycle in Metagenomics of the microbial nitrogen cycle: theory, methods and applications.**

[Sharma V](#), Chetal G, Taylor TD, Prakash T, Ed: Diana Marco. Pub: Caister Academic Press, United Kingdom. Page(s): 268. ISBN 978-1-908230-48-5. | September, 2014



**Potential cellulase production, optimization and saccharification study by novel thermophilic microbes.**

Sharma V, Vij H, Singh PK, Bhatt SM, *ABS J. Sustain. Biotech.* 1, 19-26 | 2013

**Strain Improvement of *Bacillus coagulans* and *Geobacillus stearothermophilus* for enhanced thermostable cellulase production and the effect of different metal ions on cellulase activity.**

Sharma V, Singh PK, *Int. J. Eng. Sci. Technol.*, 4(11), 4704-4709 | 2012

**Nanotechnology: an emerging future trend in wastewater treatment with its innovative products and processes.**

Sharma V, Sharma A, *Int. J. Enhanc. Res. Sci. Technol. Eng.* 1, 121-128 | 2012

**The genomics of the emerging pathogen *Gemella haemolysans*: Novel insights into antimicrobial resistance, pathogenicity, and genome evolution**

Sharma V#, Verma S#, Kaur M#, Tekchandani U, Angrup A, Singh SR, Gupta V, Under Review (*Microbes and Infection*)

**Microbial community dynamics by metagenomic profiling of synthetically designed microbial consortia for biohythane production using raw "Cow Dung" as substrate**

Rashmi#, Sharma V, Kumar S, Prakash T, Under Review (*Biodegradation*)

**Identification of resistome, mobilome, and horizontal genomics in multidrug-resistant *Bacteroides fragilis*: an in-vitro and in-silico study**

Sood A#, Sharma V, Angrup A, Ray P, Under Review (*International Journal of Antimicrobial Agents*)

**Microbial dynamics during anaerobic digestion of raw and electrofloculated waste water for biohythane production**

Rashmi, Sharma V, Kumar S, Kaul M, Prakash T, In preparation

**Synthetic microbial consortia designing using metagenomics approach for biohythane production**

Rashmi, Sharma V, Kumar S, Kaul M, Sharma L, Halder A, Prakash T, In preparation

**Comparative genomics of extraintestinal pathogenic *Escherichia coli* to explore the relationship of resistome, mobilome, and virulome with carbapenem- and colistin-resistance**

Sharma V#, Verma S#, Angrup A, Biswal M, Arora A, Ray P, In preparation

# means equal first-co author contribution, \$ means equal corresponding author contribution

## PROJECTS

**Understanding the impact of gut microbiome dysbiosis and metabolic alterations in the pathogenesis of early onset (EOCRC) Colorectal Cancer (CRC)**

**Funding Agency: All India Institute of Medical Sciences (AIIMS), New Delhi | 2022**

Role: Co-investigator.

Budget: =10,00,000 INR.

PI: Dr Jyoti Sharma, AIIMS New Delhi

Co-I: Dr Subhradip Karmakar, Dr. Sandeep Bhowmik, Dr. Rajni Yadav, AIIMS New Delhi

## ACHIEVEMENTS & AWARDS

**Invited Guest Editor for the upcoming special issue "Applications of Next-Generation Sequencing in Clinical and Public Health Microbiology" in *Genes* (2023-24)**

*Genes*, MDPI

**Instructor and Member of the Organizing Committee OF NGS-Bac—WGS 2022: ICMR- PGIMER Hands-on Workshop on Whole Genome Sequencing of Bacteria"**

PGIMER, Chandigarh, India, April 2022.

**Ambassador (2022-2023, 2020-2021, 2019-2020)**

Bentham Science Publishers, Sharjah, U.A.E.

**Ph.D. Thesis work was covered under the title "Making Recycling of Rubber Eco-Friendly in "Clean Future" section of India Science Wire (ISW) stories July 2018**

Vigyan Prasar, Department of Science and Technology, Government of India

**Secured position among the top 10% most cited PLoS One authors of 2018**

PloS One

**Best poster award in World Congress on Genetics, Genomics And Personalized Medicine 2017 held at JN Tata Auditorium - Indian Institute of Science, 22-24th November 2017**

Paper "Comparative genomics of the probiotic genus *Bifidobacterium* to explore its adaptation and evolutionary strategies in the human gut"

### **Third oral award in ANUSANDHAN-2017 held at IIT Mandi, March, India, 2017**

Paper "Comprehensive Insights into the Metabolic, Taxonomic, and evolutionary aspects of natural rubber degrading *Aurantibaculum rubberoxydans*, gen. nov., sp. nov., 35Y using comparative genomics"

### **HTRA JRF (2013-2016) and SRF (2016-2019) for Ph.D. at IIT Mandi**

Ministry of Human Resource Development, Government of India

### **Qualified TIFR-GS2012 in 2012**

Tata Institute of Fundamental Research (TIFR)

### **Secured 34th position in the merit list of the Himachal Pradesh Board of School Education.**

Plus Two (XII)

### **Secured 26th position in the merit list of the Himachal Pradesh Board of School Education.**

Matriculation (X)

## **WORKSHOPS & CONFERENCES**

Comparison of 16S rRNA gene metagenomics profile to conventional microbiological cultures of Necrotising Soft-tissue Infections (NSTIs). Vashist T, Angrup A, **Sharma V**, Tandup C, Arora A, Ray P. **ECCMID 2023 (33rd European Congress of Clinical Microbiology and Infectious Diseases), Copenhagen, Denmark held on 15 - 18 April 2023**

Detection of bacterial pathogens causing acute febrile illness using Nanopore sequencing: a feasibility and efficacy study from north India. Biswal M, Bisht K, **Sharma V**, Goel S, Sharma N. **ECCMID 2023 (33rd European Congress of Clinical Microbiology and Infectious Diseases), Copenhagen, Denmark held on 15 - 18 April 2023**

Multifaceted genetic mechanisms for colistin and carbapenem resistance in MDR and XDR *Klebsiella pneumoniae* clinical isolates. Kundu J, **Sharma V**, Angrup A, Biswal M, Ray P. **ECCMID 2023 (33rd European Congress of Clinical Microbiology and Infectious Diseases), Copenhagen, Denmark held on 15 - 18 April 2023**

"NGS-Bac—WGS 2022: ICMR- PGIMER Hands-on Workshop on Whole Genome Sequencing of Bacteria" PGIMER, Chandigarh, India, April 2022.

**TBCON 2022, Tuberculosis: A Road Towards Elimination**, PGIMER Chandigarh, India, March 2022.

In silico functional and evolutionary analyses of rubber oxygenases (RoxA and RoxB). **Sharma V**, Prakash T. **ANUSANDHAN-2019**, IIT Mandi, Mandi, Himachal Pradesh, India, February 2019.

**3rd Himachal Pradesh Science Congress on Rural Upliftment Through Science & Technology Interventions**, IIT Mandi, Mandi, Himachal Pradesh, India, October 2018.

**MATLAB Workshop 2018**, IIT Mandi, Mandi, Himachal Pradesh, India, November 2018.

Comparative genomics of the genus *Bifidobacterium* to explore its probiotic potential and evolutionary aspects of adaptation strategies in the human gut. **Sharma V**, Prakash T. **ANUSANDHAN-2018**, IIT Mandi, Mandi, Himachal Pradesh, India, March 2018.

Comparative genomics of the probiotic genus *Bifidobacterium* to explore its adaptation and evolutionary strategies in the human gut. **Sharma V**, Prakash T. **World Congress on Genetics, Genomics and Personalized Medicine 2017**, JN Tata Auditorium, Indian Institute of Science, November 2017.

Comprehensive insights into the metabolic, taxonomic, and evolutionary aspects of natural rubber degrading *Aurantibaculum rubberoxydans*, gen. nov., sp. nov., 35Y using comparative genomics. **Sharma V**, Prakash T. **ANUSANDHAN-2017**, IIT Mandi, Mandi, Himachal Pradesh, India, March 2017.

A hunt for potential signatures of human infecting strains of Herpesviridae family using comparative genomics. **Sharma V**, Prakash T. **ANUSANDHAN-2016**, IIT Mandi, Mandi, Himachal Pradesh, India, February 2016.

Mice with reduced expression of antimicrobial peptides in their gut exhibit an overall lower abundance of Fibrobacteria. Jangid A, Chetal G, Fukuda S, Suzuki Y, **Sharma V**, Taylor TD, Ohno H, Srivastava T. **International Human Microbiome Congress 2016**, Houston, Texas, USA, November 2016.

**2nd Indian Cancer Genetics (Workshop-cum-Conference)**, ACTREC Mumbai, India, November 2014.

**Bioinfogen 2013 (Workshop-cum-Conference)**, PGIMER Chandigarh, September 2013.

**Cell Dynamics and Cell Fate (All India Cell Biology Conference)**, Indian Institute of Science, Bangalore, Karnataka, India, December 2013.

**Experimental Research & Alternatives (1st National Symposium-cum-Workshop)**, PGIMER Chandigarh, India, March 2012.

## TRAINING COURSES

### **Certification of completion of course - Whole Genome Variant Calling @ Linux**

Udemy | 2023-24, City

### **Certification of completion of course - 2022 Complete Python Bootcamp From Zero to Hero in Python**

Udemy | 2023-24, City

### **Certification of completion of course - The Business Intelligence Analyst Course 2022**

Udemy | 2023-24, City

### **Certification of completion of course - Machine Learning, Data Science and Deep Learning with Python**

Udemy | 2023-24, City

### **Certification of completion of course - R Programming for Statistics and Data Science 2022**

Udemy | 2023-24, City

### **Short training course in NextSeq high-throughput sequencing system**

Illumina, Inc. at IIT Mandi, Mandi, Himachal Pradesh, India | November 2017, City

### **Short training course in MiSeq high-throughput sequencing system**

Illumina, Inc. at IIT Mandi, Mandi, Himachal Pradesh, India | November 2017, City

### **Short training course in Molecular Biology**

Shree Nanda Biotech. Pvt. Ltd. Chandigarh, India | July 2011, City

### **Short training course in Immunology & Immunotechnology**

Orbit Biotech. Pvt. Ltd. Mohali, Punjab, India | July 2010, City

### **Short training course in Biotechnology**

CSIR-IHBT Palampur, Himachal Pradesh, India | July 2009, City

### **Short training course in Bioinformatics and Computational Biology**

Lovely Professional University, Phagwara, Punjab, India | August 2008, City

## JOURNAL EDITORS/REVIEWERS

Served as Guest Editor for Genes' 2023-24 special issue focusing on "Next-Generation Sequencing in Clinical and Public Health Microbiology."

Cells, PLOS Computational Biology, European Journal of Clinical Microbiology & Infectious Diseases, PLOS Neglected Tropical Diseases, PeerJ, International Journal of Molecular Sciences, Genes, Symmetry, npg Communications Biology, Polish Journal of Environmental Studies, Environment, Development and Sustainability, Current Nutrition & Food Science, Current Women's Health Reviews, Current Bioinformatics

## MEMBERSHIP OF PROFESSIONAL SOCIETIES

International Society for Computational Biology

American Society for Microbiology

European Biotechnology Network

## PERSONAL INFORMATION

### **Name**

Vikas Sharma

### **Gender**

Male

### **Marital Status**

Unmarried

### **Nationality**

Indian

### **Email**

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## REFERENCES

Available upon request