

Parul Sharma

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Education

- 2018 – present 📖 **Ph.D.** Bioinformatics
Virginia Tech Blacksburg, USA
Thesis: *Improving pathogen identification and characterization using long- read sequencing methods*
- 2015 – 2017 📖 **M.Tech.** Computational Biology
Indraprastha Institute of Information Technology Delhi, India
Thesis: *Clinical Genomics and Personalized Medicine initiatives for Arabian Countries*
- 2011 – 2015 📖 **B.Tech.** Biotechnology
Jaypee Institute of Information Technology Noida, India
Thesis: *Studying the effects of bacteriocin-like-inhibitory substances on bacterial biofilms*

Research Experience

- 2018 – present 📖 **Graduate Research Assistant**, Virginia Tech Blacksburg, USA.
Project - Improving pathogen identification and characterization using long- read sequencing methods
Advisor: Dr Boris Vinatzer
- Aug'17 – Dec'17 📖 **Graduate Research Assistant**, Indraprastha Institute of Information Technology Delhi, India.
Project - Post mitochondrial apoptotic pathway study using Monte Carlo Modelling
Advisor: Dr Subhadip Raychaudhuri
- May'16 – Dec'17 📖 **Thesis Student**, Institute for Genomics and Integrative Biology Delhi, India.
Project - Clinical Genomics and Personalized Medicine initiatives for Arabian Countries
Advisor: Dr Vinod Scaria
- May'14 – Aug'14 📖 **Intern**, Centre for Genetic Manipulation of Crop Plants Delhi, India.
Project - Analyzing the protein content in different *Brassica* species for improving the quality of mustard seeds
Advisor: Dr Yaspal Singh Sodhi
- Dec'13 – Jan'14 📖 **Intern**, Rajiv Gandhi Cancer Hospital And Research Center Delhi, India.
Learning to perform pathological testing in Biochemistry, Microbiology, and Hematology departments

Teaching Experience

- Spring 2017 📖 **Probability and Statistics** Undergraduate Level
Graduate Teaching Assistant, IIIT-Delhi
Responsibilities: Weekly tutorials, Grading assignments, Regular Office hours
- Fall 2016 📖 **Introduction to Mathematical Biology** Graduate Level
Graduate Teaching Assistant, IIIT-Delhi
Responsibilities: Designing homework assignments, Grading, Regular Office hours

Teaching Experience (continued)

Spring 2016

■ **Critical Thinking** Undergraduate Level




Graduate Teaching Assistant, IIIT-Delhi

Responsibilities: Preparing lecture material, Facilitating classroom discussions, Grading, Regular Office hours



Publications

- 1 Failor, K. C., Liu, H., Llontop, M. E., LeBlanc, S., Eckshtain-Levi, N., **Sharma, P.**, ... Lefevre, C. et al. (2021). Ice nucleation in a gram-positive bacterium isolated from precipitation depends on a polyketide synthase and non-ribosomal peptide synthetase. *The ISME Journal*, 1–8.
[doi:10.1038/s41396-021-01140-4](https://doi.org/10.1038/s41396-021-01140-4)
- 2 Mechan Llontop, M. E., Tian, L., **Sharma, P.**, Heflin, L., Bernal Galeano, V. A., Haak, D., ... Vinatzer, B. (2021). Experimental evidence pointing to rain as a reservoir of tomato phyllosphere microbiota. *Phytobiomes Journal*, (ja).
- 3 **Sharma, P.**, Jain, A., & Scaria, V. (2021). Genetic landscape of rare autoinflammatory disease variants in qatar and middle eastern populations through the integration of whole-genome and exome datasets. *Frontiers in Genetics-Applied Genetic Epidemiology*. [doi:10.3389/fgene.2021.631340](https://doi.org/10.3389/fgene.2021.631340)
- 4 **Sharma, P.**, Johnson, M., Mazloom, R., Allen, C., Heath, L., Lowe-Power, T., & Vinatzer, B. (2021). Meta analysis of the ralstonia solanacearum species complex (rssc) based on comparative evolutionary genomics and reverse ecology. *bioRxiv*.
- 5 Vatsyayan*, A., **Sharma, P.***, Gupta, S., Sandhu, S., Venu, S. L., Sharma, V., ... Rajab, A. et al. (2021). Dalia-a comprehensive resource of disease alleles in arab population. *PLoS one*, 16(1), e0244567.
[doi:10.1371/journal.pone.0244567](https://doi.org/10.1371/journal.pone.0244567)
- 6 Mechan Llontop*, M. E., **Sharma, P.***, Aguilera Flores*, M., Yang, S., Pollok, J., Tian, L., ... Li, S. et al. (2020). Strain-level identification of bacterial tomato pathogens directly from metagenomic sequences. *Phytopathology*, 110(4), 768–779. [doi:10.1094/PHYTO-09-19-0351-R](https://doi.org/10.1094/PHYTO-09-19-0351-R)
- 7 Roman-Reyna, V., Truchon, A., **Sharma, P.**, Hand, F. P., Mazloom, R., Vinatzer, B. A., ... Allen, C. (2020). Genome resource: Ralstonia solanacearum phylotype ii sequevar 1 (race 3 biovar 2) strain uw848 from the 2020 us geranium introduction. *Plant disease*, PDISo62o1269A. [doi:10.1094/PDIS-06-20-1269-A](https://doi.org/10.1094/PDIS-06-20-1269-A)
- 8 Sharma, G., Sharma, S., **Sharma, P.**, Chandola, D., Dang, S., Gupta, S., & Gabrani, R. (2016). Escherichia coli biofilm: Development and therapeutic strategies. *Journal of applied microbiology*, 121(2), 309–319.
[doi:10.1111/jam.13078](https://doi.org/10.1111/jam.13078)
- 9 Sivadas, A., **Sharma, P.**, & Scaria, V. (2016). Landscape of warfarin and clopidogrel pharmacogenetic variants in qatari population from whole exome datasets. *Pharmacogenomics*, 17(17), 1891–1901.
[doi:10.2217/pgs-2016-0130](https://doi.org/10.2217/pgs-2016-0130)
- 10 Dangayach, S., **Sharma, P.**, Singhai, P., & Gupta, N. (2014). Microbial removal of arsenic: Mechanisms and applications. *As. J. Multidis. Stud*, 2, 159–170. Retrieved from
<https://parul-sharma.github.io/parul-sharma.github.io/793-2281-1-PB.pdf>







Additional Projects

- 2019 – 2020  **Verification of a new species of *Pseudomonas***
Advisor: Dr Boris Vinatzer & Dr. Carollee Bull
Verifying the identification and taxonomic classification of a new *Pseudomonas* species isolated from wheat in Brazil using different genomic tools.
– phylogenomics, taxonomy, new species, core-genome, R, python
- 2019 – 2019  **Multi-omics Pipeline**
Advisor: Dr Song Li
MoP is a pipeline that integrates metagenomics, metatranscriptomics and metaproteomics data and uses all datasets to obtain a broader set of useful and insightful information from the samples.
– metagenomics, clinical data, IBD study, pipeline tool, shell scripting, python
- 2016 – 2017  **Online tool for reporting of Incidental findings**
Advisor: Dr Vinod Scaria
Developing a web-based tool that checks if a sequencing data has variants falling on any of the ACMG provided minimum list of 59 genes using a manually curated dataset.
– Python, SQL, HTML, CSS






Computational Skills

- Coding Languages  Python, R, shell-scripting, C, C++, MATLAB, SQL, HTML, CSS, \LaTeX
- Worked on  Jupyter Notebook, R-studio, Matlab, Eclipse, PyCharm, High Performance computing (cloud/AWS)

Awards and Honors

- 2021  **Travel Grant**, Graduate Student Association Travel Fund Program.
- 2020  **1st prize for Oral Presentation**, American Phytopathological Society – Potomac Division Meeting.
-  **1st Prize for Flash Talk**, Graduate Student Association Research Symposium.
- 2019  **Best Poster**, School of Plant and Environmental Sciences, Graduate Student Poster Showcase.
- 2015  **Complete Tuition Waiver for Master's degree**, Department of Biotechnology, India.
-  **Scholarship for qualifying the Graduate Aptitude Test in Engineering**, Ministry of Human Resource Development, Government of India.

Oral Presentations

-  Genome-based circumscription of cool-virulent *Ralstonia solanacearum* strains in an attempt to improve their regulation, **Plant Health 2020**, *Online*.
-  Genome-based circumscription of cool-virulent *Ralstonia solanacearum* strains in an attempt to improve their regulation, **American Phytopathological Society Potomac Division Meeting**, 2020, *Online*.
-  Strain-level identification of tomato pathogens from metagenomic sequences obtained with the ONT MinION **Graduate Student Association Research Symposium**, 2020, *Online*.
-  Strain-level identification of tomato pathogens from metagenomic sequences obtained with the ONT MinION **Nanopore Community Meeting 2019**, *New York*.
-  Hi Alexa! What's wrong with my tomato plant? **Nutshell Games 2019**, *Virginia Tech*.

Poster Presentations

- Cool virulence: Catch me if you can, **School of Plant and Environmental Sciences Graduate Student Poster Showcase**, 2021, *Virginia Tech, USA*.
- A comparative genomics investigation into cool-virulence in *Ralstonia solanacearum* to improve its phytosanitary regulation, **Plant Health 2021**, *Online*.
- Classification of the *Ralstonia solanacearum* species complex based on population and comparative genomics, **World Microbe Forum**, 2021, *Online*.
- Strain-level identification of tomato pathogens from metagenomic sequences obtained with the ONT MinION, **School of Plant and Environmental Sciences Graduate Student Poster Showcase**, 2019, *Virginia Tech, USA*.
- Strain-level identification of tomato pathogens from metagenomic sequences obtained with the ONT MinION **Nanopore Community Meeting 2019**, *New York, USA*.
- Pharmacogenetic variant analysis In Arab Populations from Exome Data, **Research Showcase**, 2017, *Delhi-India*.
- Antimicrobial peptides as potential therapeutics against bacteria, **National Conference on “Recent Advances in Biological Sciences” organized by Society of young scientists**, 2014, *Delhi-India*.

Volunteer and Outreach Activities

- Member of the Graduate Honor Society at Virginia Tech 2020-2021.
- Served as a Judge for the Western Virginia Regional Science Fair 2020 at Hollins University *Mar 21, 2020*.
- Served as a Judge for the Roanoke County Science Fair 2020 at William Byrd Middle School *Feb 22, 2020*.
- Volunteer at Friendicos Dog Shelter in Delhi, India. *Mar, 2017*.
- Volunteer teacher for low-income schools in Delhi to encourage underprivileged kids towards STEM careers. Taught Math, Science and Computers to 7th Grade students through interactive learning to develop critical thinking. 2015-2016