

Dr. Sandhya Verma

Assistant Professor, School of Biotechnology,
Devi Ahilya University, Indore, M.P. - 452001, India.
Contact No: +91-9354976780
E-mail: drsandhyaverma11@gmail.com



Brief profile

I have completed M.Sc. in Biotechnology (2007) from Devi Ahilya University, Indore and received PhD from National Institute of Plant Genome Research, Jawaharlal Nehru University, New Delhi. I am presently working as Assistant Professor at School of Biotechnology, DAVV, Indore. I have 16 years of research experience and more than 4 years of teaching experience to undergraduate and post-graduate students. My area of research is plant-microbe interactions, molecular plant pathology, fungal biology, and biotechnological approach to plant disease management. I have been awarded many prestigious awards and fellowships at national and international level. I have published several research articles, book chapters, and conference proceedings in journals and publishers of high repute such as The Plant cell, Biotechnology for Biofuels, Frontiers in Plant Science, Journal of Fungi, Scientific Reports, Plos One, Journal of Microbiological Methods etc. I have also received project funding as Principal Investigator under the scheme of Core Research Grant from Science and Engineering Research Board, Department of Science and Technology, Government of India, and as Co-Principal Investigator under the scheme of M.P. Council of Science & Technology.

Professional experience

- October 2023-Present, Assistant Professor, School of Biotechnology, Devi Ahilya University, Indore, M.P., India.
- June 2019-October 2023, Assistant Professor at SVIS, Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore, Madhya Pradesh.
- August 2015-June 2019, Research Associate in the group of Dr. Praveen Verma, at National Institute of Plant Genome Research, New Delhi.

Research expertise

Molecular Biology, Recombinant DNA technology, Fungal Genetics, Microbial Genetics/Genomics, Metabolism & Signal Transduction, Bioinformatics.

Research area

Plant Microbe Interactions, Molecular Plant Pathology, Fungal Biology, and Biotechnological Approach to Plant Disease Management.

Education

- Jul 2008-Jul 2015 PhD on the topic “**Molecular analysis of effector gene(s) of *Ascochyta rabiei* suppressing defense responses in *Cicer arietinum*”**, from **National Institute of Plant Genome Research (NIPGR), Jawaharlal Nehru University (JNU), New Delhi, India.**
- 2005-2007 M.Sc. in Biotechnology (First Class, 73.5%) from Devi Ahilya University, Indore, India.
- 2002-2005 B.Sc. in Biology from Barkatullah University, Bhopal, India.
- 2005-2007 Diploma in Management (First Class), conducted by Indira Gandhi National Open University, India.

Fellowships received

- Aug 2015-Jun 2019 Post-doctoral fellowship, NIPGR, New Delhi, India.
- Jul 2013-Jul 2015 Senior Research Fellowship, NIPGR, New Delhi, India.
- Jul 2010-Jul 2013 Senior Research Fellowship, CSIR, New Delhi, India.
- Jul 2008-Jul 2010 Junior Research Fellowship, CSIR, New Delhi, India.

Awards and achievements

- 1) Received "**NPTEL Star**" - **NPTEL BELIEVERS** award for Jan-Apr 2023.
- 2) **The Liver Week 2023** Travel Grant of USD 700 hosted by **The Korean Association for the Study of the Liver, Incheon, Korea from May 18th-20th, 2023.**
- 3) International member of **The Korean Society of Nephrology 2023.**
- 4) **Overseas Contribution Award** at the **6th Annual International Congress of Blood and Marrow Transplantation (ICBMT 2022)**, Busan, Korea.
- 5) APASL Travel Grant of USD 1,000 at the **31st conference of the Asian Pacific Association for the Study of the Liver**, hosted by Asian Pacific Association for the Study of the Liver, **Seoul, Korea from March 30th to April 03rd 2022.**
- 6) Achieved "**NPTEL Star**" - **SWAYAM-NPTEL Domain Certification in Biosciences** (Biotechnology and Bioscience/Bioengineering) in April 2022.
- 7) Received "**NPTEL Star**" - **NPTEL BELIEVERS** award for Jan-Apr 2022.
- 8) Received "**NPTEL Star**" - **NPTEL DISCIPLINE STAR** award in Biotechnology for Jan-Apr 2022.
- 9) Received "**NPTEL Star**" - **NPTEL MOTIVATED LEARNER** award for Jan-Apr 2022.
- 10) Appointed as “**Bentham Science Ambassador**” from India by **Bentham Science-International Publisher of Journals and Books** in March 2022.

- 11) Invited lecture entitled “Roadmap for successful COVID-19 vaccination: Operational considerations and challenges”, in the conference “Vaccine for COVID-19: A Journey from Development to Distribution” 2020, held at Govt. College Sailana, Ratlam, MP.
- 12) Received Gold medal for “**Best Scientific Presentation**”, in Student’s Research Symposium 2012, at NIPGR, New Delhi, India.
- 13) Qualified all India entrance examination for PhD in 2008, conducted by NIPGR, New Delhi, India.
- 14) Qualified the joint Council of Scientific and Industrial Research-University Grants Commission (**CSIR-UGC**) test conducted by CSIR, New Delhi, for the award of Junior Research Fellowship (**JRF-NET**) CSIR, 2007.
- 15) Qualified Graduate Aptitude Test in Engineering (2006), conducted by IIT Kanpur, India.
- 16) Qualified All India Combined Biotechnology Entrance Examination for M.Sc. in Biotechnology, conducted by Jawaharlal Nehru University (**JNU-CET 2005**), New Delhi, India and received monthly scholarship from Department of Biotechnology (DBT), government of India, during MSc session.

Research projects

1. Research project sanctioned in 10/2023 as **Co-Principal Investigator** under the scheme of **Madhya Pradesh Council of Science & Technology (MPCOST), Bhopal**.
2. Research project (File No: CRG/2020/005005) sanctioned in 12/2020 as **Principal Investigator** under the scheme of **Core Research Grant of Science and Engineering Research Board (SERB)**, Department of Science and Technology (DST), India.

Research Experience

2008-2019: National Institute of Plant Genome Research, Jawaharlal Nehru University, New Delhi, India.

Work done:

- Isolation of one of the *Ascochyta rabiei* effector genes (*Ar93*) and determining its secretion and translocation inside the host cells.
- Understanding the role of *Ar93* in conferring fungal pathogenicity.
- Isolation of *Ar93* homolog from a hemibiotrophic fungus *Cochliobolus sativus* and determining its function as an effector.
- Whole-genome sequencing of *A. rabiei* using next-generation sequencing platform and study of various genomic features.
- Secretome prediction of *A. rabiei*, its analyses and identification of putative effector candidates.
- Comparative and evolutionary analysis of *Ar93* among fungal genomes.
- Isolation of *Cicer arietinum* gene (*CaRACK1*) and determining its role in providing resistance to plant being a scaffolding protein.

Experimental techniques/scientific skills

- PCR and general molecular biology techniques
- cDNA and genomic DNA libraries
- Macromolecule blotting and probing
- Protein expression and purification
- Yeast and bacterial analytical techniques
- Microscopy
- Mycology and plant tissue culture
- Computational work related to genome sequencing and comparative genomics

Research articles published (Total articles: **15**, Impact Factor: **62.67**, Citations*: **488**, h-index*: **11**, i10-index*: **14**)

1. Shreenivas Kumar Singh, Ankita Shree*, **Sandhya Verma***, Kunal Singh, Kamal Kumar, Vikas Srivastava, Ritu Singh, Samiksha Saxena, Agam Prasad Singh, Ashutosh Pandey, & Praveen Kumar Verma (2023). The nuclear effector ArPEC25 from the necrotrophic fungus *Ascochyta rabiei* targets the chickpea transcription factor CaβLIM1a and negatively modulates lignin biosynthesis, increasing host susceptibility. *Plant Cell* (doi: 10.1093/plcell/koac372) (* - **Equal contribution**) (IF: **12.085**)
2. **Sandhya Verma*** and Niharika Sharma (2023). Medicinal plants and their products for the management of Poxviruses: A Mini Review. *Cohesive Journal of Microbiology & Infectious Disease*. (IF: **1.033**)
3. Nancy Bhagat, Shanu Magotra, Rikita Gupta, Shikha Sharma, **Sandhya Verma**, Praveen Kumar Verma, Tahir Ali, Ankita Shree, & Jyoti Vakhlu (2022). Invasion and colonization of pathogenic *Fusarium oxysporum* R1 in *Crocus sativus* L. during corm rot disease progression. *Journal of Fungi* (IF: **5.724**)
4. Kartar Singh, Rashmi Aggarwal, Praveen Kumar Verma, **Sandhya Verma**, Sapna Sharma, C. Manjunatha, Manoj Choudhary, Deepika Kulshreshtha, & Kirti Rawat (2021). Functional analysis of SCD1 gene involved in pathogenicity of spot blotch disease of wheat causing fungus *Bipolaris sorokiniana*. *Indian Phytopathology* (IF: **0.458**)
5. Anmoldeep Randhawa, Nandita Pasari, Tulika Sinha, Mayank Gupta, Anju M. Nair, Olusola A. Ogunyewo, **Sandhya Verma**, Praveen Kumar Verma, & Syed Shams Yazdani (2021). Blocking drug efflux mechanisms facilitate genome engineering process in hypercellulolytic fungus, *Penicillium funiculosum* NCIM1228. *Biotechnology for Biofuels* (IF: **7.670**)
6. Ranjeet Maurya, Yeshveer Singh, Manisha Sinha, Kunal Singh, Pallavi Mishra, Shreenivas Kumar Singh, **Sandhya Verma**, Kanchan Prabha, Kamal Kumar, & Praveen Kumar Verma

(2020). Transcript profiling reveals potential regulators for oxidative stress response of a necrotrophic chickpea pathogen *Ascochyta rabiei*. **3 Biotech (IF: 2.406)**

7. Madan Kumar, **Sandhya Verma**, Rajesh Kumar Gazara, Manish Kumar, Ashok Pandey, Praveen Kumar Verma, & Indu Shekhar Thakur (2018). Genomic and proteomic analysis of lignin degrading and Polyhydroxyalkanoate accumulating β -proteobacterium *Pandoraea* sp. ISTKB. **Biotechnology for Biofuels**, (DOI: 10.1186/s13068-018-1148-2). **(IF: 7.670)**
8. Momota Potshangbam, Dinabandhu Sahoo, Praveen Verma, **Sandhya Verma**, Mohan Chandra Kalita, & Sarangthem Indira Dev (2018). Draft genome sequence of *Bacillus altitudinis* Lc5, a biocontrol and plant growth-promoting endophyte strain isolated from indigenous black rice of Manipur. **Microbiology Research Announcements**, (DOI: 10.1128/genomeA.00601-18) **(IF: 0.877)**
9. **Sandhya Verma**, Rajesh K Gazara, & Praveen K Verma (2017). Transcription factor repertoire of necrotrophic fungal phytopathogen *Ascochyta rabiei*: Predominance of MYB transcription factors as potential regulators of secretome. **Frontiers in Plant Science**, (DOI: 10.3389/fpls.2017.01037). **(IF: 6.627)**
10. Madan Kumar, Rajesh Kumar Gazara[#], **Sandhya Verma[#]**, Manish Kumar, Praveen Kumar Verma, & Indu Shekhar Thakur (2016). Genome Sequence of *Pandoraea* sp. ISTKB, a lignin degrading β -proteobacterium, isolated from the rhizospheric soil. **Microbiology Research Announcements**, (DOI: 10.1128/genomeA.01240-16). (# - Equal contribution) **(IF: 0.877)**
11. Manish Kumar, Rajesh Kumar Gazara[#], **Sandhya Verma[#]**, Madan Kumar, Praveen Kumar Verma, & Indu Shekhar Thakur (2016). Genome sequence of carbon dioxide sequestering *Serratia* sp. ISTD04 isolated from marble mining rocks. **Microbiology Research Announcements**, (DOI: 10.1128/genomeA.01141-16). (# - Equal contribution) **(IF: 0.877)**
12. **Sandhya Verma**, Rajesh Kumar Gazara, Shadab Nizam, Sabiha Parween, Debasis Chattopadhyay, & Praveen Kumar Verma (2016). Draft genome sequencing and secretome analysis of fungal phytopathogen *Ascochyta rabiei* provides insight into the necrotrophic effector repertoire. **Scientific Reports**, (DOI: 10.1038/srep24638). **(IF: 4.996)**
13. Shadab Nizam, **Sandhya Verma**, Nilam Nayan Borah, Rajesh Kumar Gazara, & Praveen Kumar Verma (2014). Comprehensive genome-wide analysis reveals different classes of enigmatic old yellow enzyme in fungi. **Scientific Reports**, (DOI: 10.1038/srep04013). **(IF: 4.996)**
14. Shadab Nizam, Rajesh Kumar Gazara, **Sandhya Verma**, Kunal Singh, & Praveen Kumar Verma (2014). Comparative structural modeling of six old yellow enzymes (OYEs) from the necrotrophic fungus *Ascochyta rabiei*: Insight into novel OYE classes with differences in

cofactor binding, organization of active site residues and stereopreferences. *PLOS ONE*, (DOI: 10.1371/journal.pone.0095989). (IF: 3.752)

15. Shadab Nizam, **Sandhya Verma**, Kunal Singh, Rashmi Aggarwal, Krishna Dutt Srivastava, & Praveen K Verma (2012). High reliability transformation of the wheat pathogen *Bipolaris sorokiniana* using *Agrobacterium tumefaciens*. *Journal of Microbiological Methods*, **88**: 386–392. (IF: 2.622)

*Google scholar (<https://scholar.google.de/citations?user=po7yN6EAAAAAJ&hl=en>)

Book chapters published

1. **Verma S[#]** and Gazara RK (2021). Big Data Analytics for understanding and fighting COVID-19. In: Khalid Raza (Ed.), **Computational Intelligence Methods in COVID-19: Surveillance, Prevention, Prediction and Diagnosis**. Series: **Studies in Computational Intelligence**. Springer Nature, USA, Vol. 923, pp. 333-348. (# Corresponding author)
2. **Verma S[#]** and Gazara RK (2021). Next-generation sequencing: An expedition from workstation to clinical applications. In: Khalid Raza (Ed.), **Translational Bioinformatics in Healthcare**, Elsevier, USA, Vol. 13, pp. 29-47 (# Corresponding author)
3. Singh SK[#], **Verma S[#]** and Verma PK (2016). Genetically engineered crops against bacterial and fungal diseases: a war of attrition. In: Dubey, Sangwan and Pandey (eds), **Current Developments in Biotechnology and Bioengineering, Book 8: Crop Modification, Nutrition and Food Production**. Elsevier, USA, pp125-147. (# Equal Contribution)
4. **Verma S**, Nizam S and Verma PK (2013). Biotic and abiotic stress signaling in plants. In: Sarwat M, Ahmad A, Abdin MZ (eds), **Stress Signaling in Plants: Genomics and Proteomics Perspective**, Volume 1. Springer Science, New York, USA, pp25-49.

Genome sequences submitted at NCBI

1. The whole genome sequence of the phytopathogenic fungus *Ascochyta rabiei* has been deposited at DDBJ/EMBL/GenBank under the accession JYNV00000000 and is now publicly released.
2. The whole genome sequence of lignin degrading bacterium *Pandoraea* sp. ISTKB has been deposited at DDBJ/EMBL/GenBank under the accession MAOS00000000 and is now publicly released.

3. The whole genome sequence of carbon-dioxide sequestering bacterium *Serratia* sp. ISTD04 has been deposited at DDBJ/EMBL/GenBank under the accession MBDW000000000 and is now publicly released.

Abstracts published in conferences

1. **Verma S** and Varma V (2022). A questionnaire-based survey to evaluate Indian post-transplant survivors' (PTS) understanding of the possibility of long-term side effects. **6th Annual International Congress of Blood and Marrow Transplantation (ICBMT)**, Sept 1-3, Busan, Korea. (e-poster)
2. **Verma S** and Varma V (2021). Hematological indices and biochemical parameters as early predictors of type 2 diabetes mellitus nephropathy. **10th International Congress on Lipid and Atherosclerosis**, Sept 10-11, Seoul, Korea. (e-poster)
3. **Verma S**, Kumar K, Verma PK (2015). Functional characterization of a key regulator of innate immunity, *CaRACK1*, in chickpea in response to necrotrophic fungus *Ascochyta rabiei*. **3rd International Plant Physiology Congress. Challenges and Strategies in Plant Biology Research**, Dec 11-14, held at Jawaharlal Nehru University (JNU), New Delhi, India.
4. **Verma S**, Singh SK, Gazara RK, Singh AP, Verma PK (2015). Genome sequencing, secretome prediction and functional characterization of a novel effector PEC25 from necrotrophic fungal phytopathogen *Ascochyta rabiei*. **56th International Annual Conference of The Association of Microbiologists of India (AMI-2015) & International Symposium on Emerging Discoveries in Microbiology**, Dec 7-10, held at Jawaharlal Nehru University (JNU), New Delhi, India.
5. **Verma S**, Verma PK (2015). Genome and secretome analyses of a necrotrophic fungus, *Ascochyta rabiei*, reveals novel apoplastic effectors. **12th New Phytologist workshop. The apoplast as battleground for plant-microbe interactions**, July 9-10, held at Castle Rauischholzhausen, Giessen, Germany.

NPTEL FDP courses

The following NPTEL FDP courses have been successfully completed:

1. Organic Farming for Sustainable Agricultural Production (Sept 2023)	9. Biointerface Engineering (Mar 2022)
2. Organ Printing (Sept 2023)	10. Bioengineering: An Interface with Biology and Medicine (Topper in this course) (Mar 2022)

3. Experimental Biochemistry (Apr 2023)	11. Tissue Engineering (Sept 2021)
4. Medical Biomaterials (Apr 2023)	12. Cell Culture Technologies (Sept 2021)
5. Human Molecular Genetics (Mar 2023)	13. Biochemistry – IITKGP (Apr 2021)
6. Plant Developmental Biology (Mar 2023)	14. Cell Biology: Cellular organization, division and processes (Apr 2021)
7. Structural Biology (Apr 2022)	15. Genetic Engineering: Theory and Application (Dec 2020)
8. Basics of Biology (Apr 2022)	16. Experimental Biotechnology (Dec 2020)

FDP courses attended

1. AICTE approved FDP on “Nanobiotechnology in drug discovery, development and delivery”, 2020, IIT Indore.
2. NHTD MDP on “Safety of women at workplace with special reference to sexual harassment”, 2020, SVVV, Indore.
3. National one week FTP under Internal Quality Assurance Cell and DBT Star College Program “Pedagogical Training for Effective Online Teaching and Learning”, 3-10 August 2020, Deen Dayal Upadhyay College, University of Delhi.
4. University level two weeks “Faculty Induction Program 2019” at SVVV, Indore.

Weblinks

<https://orcid.org/0000-0002-9547-6786>

<https://www.scopus.com/authid/detail.uri?authorId=56302918100>

<https://scholar.google.co.in/citations?user=cKZPdKsAAAAJ>

<https://www.webofscience.com/wos/author/record/AA Y-4870-2020>

Potential Referees

1) Dr. Anjana Jajoo

Professor; School of Life Sciences

Head; School of Biotechnology, Devi Ahilya University, Indore - 452001, India

E-mail: anjanajajoo@hotmail.com

Tel. +91-731-477166

2) Dr. K N Guruprasad

Director, Shri Vaishnav Institute of Science,

Shri Vaishnav Vidyapeeth Vishwavidyalaya,

Indore – Ujjain Road, Indore, Madhya Pradesh-453111, India

Email: knguruprasad@hotmail.com

Ph. +91-9993105989

3) Dr. Praveen K Verma

Director (R&D), Jawaharlal Nehru University, New Delhi-110067, India

Professor, Cell and Molecular Biology, School of Life Sciences, Jawaharlal Nehru University, New Delhi-110067, India

Scientist VI (on lien), National Institute of Plant Genome Research, Aruna Asaf Ali Marg, New Delhi-110067

Adjunct Faculty (Ayurveda Biology): SSIS, Jawaharlal Nehru University, New Delhi

Email: praveenkverma@jnu.ac.in; praveenkverma@mail.jnu.ac.in

Phone: +91-9911119929