

# Curriculum Vitae

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## Dr. SAHELI PRADHAN

Senior Research Associate,

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### Personal Details

<b>Name:</b>	SAHELI PRADHAN
<b>Date of Birth:</b>	12.08.1986
<b>Sex:</b>	Female
<b>Marital Status:</b>	Married
<b>Nationality:</b>	Indian
<b>Current Address:</b>	Flat no 0406, C Wing, Arctica CHSL, Casa Rio, Lodha Palava City, Dombivali East, Thane, Maharashtra, 421204
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### Educational Qualification

**Doctor of Philosophy (Ph.D.)** in Botany from Calcutta University **(2016)**

***Thesis Title:*** “Micronutrient nanoparticles: Synthesis, Characterization and Efficacy Studies in Plant System”

Ph.D. Supervisor: Prof. Arunava Goswami (Biological Sciences Division, Indian Statistical Institute, Kolkata)

**Master of Science (MSc.)** in Botany from University of Calcutta **(2009) [1<sup>st</sup> class, 72.4%]**

***Specialization:*** Plant Physiology, Biochemistry and Biotechnology

**Bachelors of Science (BSc.)** in Botany from University of Calcutta **(2007) [1<sup>st</sup> class, 68.4%]**

### Professional Experience (Teaching and Research)

**Senior Research Associate (February 2022 - Present)**, Food Technology Division, Bio-Science Group (BSG), Bhabha Atomic Research Centre (BARC), Trombay, Mumbai, Maharashtra.  
[Supervisor : Dr. Sumit Gupta]

**Assistant Professor (Adhoc) (July 2021 – January 2022)** Department of Botany, B. K. Birla College of Arts, Science & Commerce (Autonomous), Kalyan, Maharashtra.

**Assistant Professor (July 2019 – July 2021)** Department of Botany, School of Basic and Applied Sciences, Career Point University, Kota, Rajasthan.

**National Post-Doctoral Fellow (NPDF) (April 2018 – June 2019)**, In Biological Sciences, at Department of Agronomy and Soil Science at **CSIR-CIMAP, Lucknow** [Supervisor: *Dr. Saudan Singh*]

**Research Associate (November 2016 – October 2017)**

In the Department of Agricultural and Food Engineering of Indian Institute Technology, Kharagpur (IIT, Kharagpur) [Supervisor: *Dr. Damodhara Rao Mailapalli*]

### Research Details

**Ph.D. Topic:** ‘Micronutrient nanoparticles: Synthesis, Characterization and Efficacy Studies in Plant System’. Salient research objectives are:

1. Synthesis and physicochemical characterization of micronutrient NPs.
2. Profiling of modulation of physiology by micronutrient NPs using suitable plant model system.
3. Mode of action study of micronutrient NPs using plant model system.
4. Biosafety studies of micronutrient NPs on plant, animal and different environmental parameters with special emphasis on soil and its biota.

**Postdoctoral Topic:**

- (a) “Designing of micronutrient doped nutrient nanocarrier for the enhancement of in vitro withanolides production in medicinally important *Withania* spp.” (with Prof. Saudan Singh)
- (b) “Application of nano-fertilizers for improved crop production and nutrient use efficiency (NPN)” (with Dr. Damodhara Rao Mailapalli)
- (c) “Newer applications of radiation technology for food security and value addition.” (with Dr. Sumit Gupta)

### Research Keywords

(i) Micronutrient nanoparticles, (ii) Nanofertilizers, (iii) Plant nutrition, (iv) Photosynthesis, (v) Plant tissue culture, (vi) Genetic modulation, (vii) cloning, (viii) Toxicological assessment, (ix) Molecular biology, (x) Biochemical and biophysical techniques (xi) Functional food (xii) Nutraceuticals

### Techniques Known

UV-Vis spectroscopy, FTIR, Fluorescence spectroscopy, Dynamic Light Scattering (Malvern), Zeta Potential Analysis, Inductively Coupled Plasma Optical Emission Spectroscopy, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Atomic Force Microscopy

(AFM), PCR, RT-PCR, DNA Gel Electrophoresis, Western Blot, Fungal and Plant tissue culture, Phyto-chemistry of medicinal plants, Fermentation technology, Functional food.

### Peer Reviewed Publications

1. Urea loaded hydroxyapatite nanocarrier for efficient delivery of plant nutrients in rice: A step towards sustainable agriculture. S. Pradhan, M. Durgam, D. R. Mailapalli. *Archives of Agronomy and Soil Science*, DOI: 10.1080/03650340.2020.1732940 (2020) [Impact factor: 3.092, No. of citations: 6]
2. Assessment of photo-modulation, nutrient-use efficiency and toxicity of iron nanoparticles in *Vigna radiata*. S. Pradhan, S. Barik, A. Goswami. *Environmental Science: Nano*. (2019) 6, 2544-2552. [Impact factor: 8.131, No. of citations: 6]
3. Interaction of engineered nanoparticles with agri-environment. S. Pradhan, D. R. Mailapalli. *Journal of Agricultural and Food Chemistry*. (2017) 65, 8279–8294. [Impact factor: 5.279, No. of citations: 51]
4. Copper Nanoparticle (CuNP) Nanochain Arrays with a Reduced Toxicity Response: A Biophysical and Biochemical Outlook on *Vigna radiata*. S. Pradhan, P. Patra, S. Mitra, K. K. Dey, S. Basu, S. Chandra, P. Palit, A. Goswami. *Journal of Agricultural and Food Chemistry*. (2015) 63, 2606-2617. [Impact factor: 5.279, No. of citations: 40]
5. Manganese nanoparticle: impact on non-nodulated plant as a potent enhancer in nitrogen metabolism and toxicity study both in vivo and in vitro. S. Pradhan, P. Patra, S. Mitra, K. K. Dey, S. Jain, S. Sarkar, S. Roy, P. Palit, A. Goswami. *Journal of Agricultural and Food Chemistry*. (2014) 47, 13122-13131. [Impact factor 5.279, No. of citations: 69]
6. A detailed molecular biochemical and biophysical study of Manganese nanoparticles, a new nano modulator of photochemistry on Plant model, *Vigna radiata* and its biosafety assessment. S. Pradhan, P. Patra, S. Das, S. Chandra, S. Mitra, K. Kumar Dey, S. Akbar, P. Palit, A. Goswami. *Environmental Science and Technology*. (2013) 47, 13122-13131. [Impact factor: 9.028, No. of citations: 202]
7. Enhancement of photon absorption in the light-harvesting complex of isolated chloroplast in the presence of plasmonic gold nanosol—a nanobionic approach towards photosynthesis and plant primary growth augmentation. S. Das, N. Debnath, S. Pradhan, A. Goswami. *Gold Bulletin*. (2017) 50, 247–257. [Impact factor: 2.279, No. of citations: 13]
8. High throughput electron transfer from aminated carbon dots to the chloroplast: A rationale of enhanced photosynthesis. S. Chandra, S. Pradhan, S. Mitra, P. Patra, A. Goswami. *Nanoscale*. (2014) 6, 3647-3655. [Impact factor: 7.79, No. of citations: 81]
9. Entomotoxicity and biosafety assessment of PEGylated acephate nanoparticles: A biologically safe alternative to neurotoxic pesticides. S. Pradhan, I. Roy, G. Lodh, P. Patra, S. Roychoudhury, A. Samanta, A. Goswami. *Journal of Environmental Science and Health, Part B*. (2013) 48, 559–569. [Impact factor: 1.91, No. of citations: 27]

10. Microwave synthesis of ZnO@mSiO<sub>2</sub> for detailed antifungal mode of action study: Understanding the insights into oxidative stress. S. Mitra, P. Patra, **S. Pradhan**, N. Debnath, K. K. Dey, S. Sarkar, D. Chattopadhyay, A. Goswami. *Journal of Colloid and Interface Science* (2015) 15, 97–108. [Impact factor: 8.128, No. of citations: 24]
11. Simple synthesis of biocompatible biotinylated porous hexagonal ZnO nanodisc for targeted doxorubicin delivery against breast cancer cell: *In vitro* and *in vivo* cytotoxic potential. P. Patra, S. Mitra, A. Dasgupta, **S. Pradhan**, S. Bhattacharya, M. Ahir, S. Mukherjee, S. Sarkar, S. Roy, S. Chattopadhyay, A. Adhikary, A. Goswami, D. Chattopadhyay. *Colloids and Surfaces B: Biointerfaces*. (2015) 133, 88–98. [Impact factor: 5.268, No. of citations: 15]
12. Damage of lipopolysaccharides in outer cell membrane and production of ROS-mediated stress within bacteria makes nano zinc oxide a bactericidal agent. P. Patra, S. Roy, S. Sarkar, S. Mitra, **S. Pradhan**, N. Debnath, A. Goswami. *Applied Nanosciences* (2015) 5, 857-866. [Impact factor: 3.674, No. of citations: 27]
13. Preparation and characterization of acephate nano-encapsulation complex. S. Roy Choudhury, **S. Pradhan**, A. Goswami. *Nanoscience Methods*. (2012) 1, 9–15. [No. of citations: 29]
14. Nature-inspired novel drug design paradigm using nano silver: efficacy on multi-drug-resistant clinical isolates of tuberculosis. D. Seth, S. Roy Choudhury, **S. Pradhan**, S. Gupta, D. Palit, S. Das, N. Debnath, A. Goswami, *Current Microbiology*, (2011) 62, 15-26. [Impact factor: 2.16, No. of citations: 58]
15. Surface modified sulfur nanoparticles: an effective antifungal agent against *Aspergillus niger* and *Fusarium oxysporum*. S. Roy Choudhury, M. Ghosh, A. Mandal, D. Chakravorty, M. Pal, **S. Pradhan**, A. Goswami. *Applied Microbiology and Biotechnology*. (2011) 90, 733–743. [Impact factor 3.53, No. of citations: 86]
16. A simple method for estimation of sulfur in nanoformulations by UV spectrometry. R. Kumar, K. K. Nair, Md I. Alam, R. Gogoi, P. K. Singh, C. Srivastava, S. Yadav, M. Gopal, S. Roy Choudhury, **S. Pradhan**, A. Goswami. *Current Science*, (2011) 100, 1542-1546. [Impact factor: 1.102, No. of citations: 30]
17. Influence of selenium on growth and metabolism in rice (*Oryza sativa*) and its possible interaction with sulphate. D. Das, **S. Pradhan**, A. K. Biswas. *Indian Journal of Plant Physiology*, (2011) 16, 1. [Impact factor: 0.54, No. of citations: 6]
18. Effect of Cu-doped carbon nanoparticle (CuCNP) on *Vigna radiata*. **S. Pradhan**, S. Chandra. *International Journal of Multidisciplinary Research Configuration*, (2021) 1. DOI: 10.5281/zenodo.4686450.

**Total impact factor: 72.469 (h index: 16, Citation 1002)**

1. Biodiesel: A sustainable resource. **S. Pradhan**, S.Mitra (ISBN: 9789354080746)

### Book Chapters

1. Nanopesticide: a new perspective on the pest control management. **S. Pradhan**, D. R. Mailapalli. *Sustainable Agriculture Reviews*, 2020 (ISBN: 978-3-030-33281-5).
2. Interaction of Nanoparticles with Crop Plants: Their Implication in Nutritional Imbalance and Environmental Toxicity. **S. Pradhan**, S. Barik, A. Goswami. *Nanoscale Engineering in Agricultural Management*, 2019, Chapter 8, 140-150.(ISBN : 9781138567016)

### Patents Filed

“Hexaconazole Nanoencapsulation: A novel fungicide and the process for making the same”. M. Gopal, S. Roy Choudhury, I. Roy, **S. Pradhan**, C. Devakumar, B. Subrahmanyam, C. Srivastava, R. Gogoi, R. Kumar, A. Goswami. (Indian Patent Application, 2011) (Cited 12)

### Member of Editorial Board

- International Journal of Multidisciplinary Research Configuration (IJOMRC)

### Member of Reviewer Committee

- RSC Environment Science Nano
- Mini-Reviews in Medicinal Chemistry
- Journal of Plant Growth Regulation
- Journal of Photochemistry & Photobiology, B: Biology

### Courses Taught

- Diversity of cryptogams (Bryophytes, Pteridophytes and Paleobotany)
- Taxonomy and diversity of seed plants
- Structure, development and reproduction of flowering plants
- Plant physiology, biochemistry and biotechnology
- Plant tissue culture
- Ecology and phytogeography
- Advanced plant pathology
- Cell Biology
- Molecular Biology
- Bio-analytical Techniques

### Honors and Awards

- Recipient of **Institute PhD Research Fellowship** at Indian Statistical Institute, Kolkata (2011)
- Recipient of **SERB-National Postdoctoral Fellowship** (2017)

- Recipient of Senior Research Associate award from Bhabha Atomic Research Centre, Mumbai (2022)

### Seminars / Workshops Attended

- Winter School on Plant Chromosome Techniques and Biometry, held in the Department of Botany, Presidency College, Kolkata (2006).
- UGC sponsored workshop on Plant Physiology and Biochemistry, held at the Department of Botany, Bethune College, Kolkata (2007).
- Symposium on Plant Biotechnology and its relevance to Food Security, supported by the Department of Biotechnology, Govt. of India (2008).
- International Conference on Advanced Nanomaterials and Nanotechnology (ICANN-2009) organized by Centre for Nanotechnology, IIT Guwahati, India (2009).
- International Conference on Frontiers in Biological Sciences" (InCoFIBS- 2010) at National Institute of Technology, Rourkela, Orissa, India (2010).
- Indo-US Bilateral Workshop 2010 on "Sedimentation, Erosion, Flooding and Ecological Health of Rivers(WSEHR-10)" organized by Fluvial Mechanics Laboratory (FML), Physics and Applied Mathematics Unit, Indian Statistical Institute, Kolkata, India and Illinois State Water Survey, University of Illinois at Urbana-Champaign, USA (2010).
- International Symposium-Trends in Plant Science Research" conducted by Department of Botany, University of Calcutta on 15-16<sup>th</sup> February, 2014.

### Poster Presentation

- "A Novel Approach to Organophosphate Insecticide: Acephate" (InCoFIBS-2010), abstract was published in the conference proceedings.
- Neurocon 2011 conducted by the Dept. of Biochemistry, Institute of Post graduate Medical Education and Research, Kolkata in collaboration with Cell Biology and Physiology Division, Indian Institute of Chemical Biology, Kolkata, India.
- Awarded **Excellent Poster award** in the "International Symposium-Trends in Plant Science Research" conducted by Department of Botany, University of Calcutta on 15-16<sup>th</sup> February, 2014.

### Oral Presentation

- Invited key-note speaker in International Conference "Translational Approach in Clinical, Environment and Biotechnological Research (GenePro2019)"
- "Bio-engineering the plant physiological pathways with the micronutrient nanoparticles" in the Two-Day International Virtual Conference on "Current Trends in Advanced Chemistry"(CTAC - 2020), organized by the Department of Chemistry, Saranathan College of Engineering, Trichy-12 from 17th to 18th August 2020.
- "Nanoencapsulation with chitosan – novel approach to overcome insect resistance" in the conference "Conquering Impact of Climate Change on Agriculture through Organic Farming – A Global Perspective" on 2011 at Aligarh University.

## Session Chair

- Chaired the session in National Conference on “Recent advancements in Pharmaceutical, Agriculture, Science and Healthcare system” on 17-18<sup>th</sup> June 2021 organized by Career Point University Kota.

## References

1. **Prof. Arunava Goswami**

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Indian Institute Technology, Kharagpur (IIT, Kharagpur)  
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