

## Dr. Nicky Singh

Flat No. 1208, Omkar Residency,  
CHS Ltd  
Plot No. 3, Sector-9  
Ulwe- 410206  
Navi Mumbai

Email: [nickysinghraj@gmail.com](mailto:nickysinghraj@gmail.com)  
Ph no.: 9433206682



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### PROFILE

- My reliability, communication skills, responsibility and friendly nature are assets I would bring to the work. I have experience in project management and strong organizational and administrative skills with the ability to work independently and use my own initiative. I also have the ability to prioritize whilst under pressure meeting tight deadlines. I have specific experience in research, data collection and analysis.
- Diligent & competent professional with high caliber over more than **15 years** of committed experience in research & development including **6 years** in **developing bioinoculum** for legume plants to sustain salinity, **and** with **Jute Corporation of India** for retting of jute with microbial technology and also worked on UGC funded project as **Women Scientist** on mushroom's biochemical and molecular aspects.
- Equipped with skills in research, coordination, team management, collaborative work and ontime deployment of deliverables.
- Worked as assistant editor for Journal of Mycopathological Research of India Mycological Society, India
- Exemplary academic credentials; Ph.D in **Botany, Specialization: Microbiology and Plant Pathology** from University of Calcutta.
- Outstanding researcher having published 9 research papers in pioneered journals of National/International importance including one review chapter in Agricultural Microbiology published by Pointer Publisher, Jaipur □ **Three patents on nanotechnology.**
- Expertise in microbial technology.
- Adept at organizing and reporting data/ conclusions orally and in writing. Flexible in adjusting to new situations coupled with good interpersonal and relationship management skills.
- Adapted to new systems, processes well, and seeks out training to enhance knowledge, skills and abilities.
- Conducts research or seeks counsel of experts to gather information needed in making actual decisions.
- Always updated with the current scientific literature and good in interpreting results

- I am able to work in a multi-cultural team and adapt to new cultures. My previous positions have involved working in remote areas often under difficult conditions with significant physical fieldwork.

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## RESEARCH SKILLS

### ➤ **Bio-nanotechnology:**

Green synthesis of nanoparticles, Characterisation of nanoparticles: UV-Vis spectroscopy, Transmission Electron Microscopy (TEM), Scanning Electron Microscopy (SEM), Dynamic Light Scattering (DLS), Zeta Potential, Atomic Force Microscopy (AFM), X-RAY Diffraction (XRD).

### ➤ **Molecular Biology:**

Gene cloning, Restriction digestion-ligation, colony screening, DNA (plasmid, genomic) isolation, PCR, Sequencing.  
RNA isolation, cDNA preparation & gene expression study (Real-time PCR)  
Total Protein isolation, SDS-PAGE analysis.

### ➤ **Tissue culture techniques:**

Seed sterilization, callus induction, gene delivery into plant, selection and regeneration of the transgenic plant, micro-propagation, and hormone and media preparation.

### ➤ **Microbiology:**

Antibiotic and media preparation, bacterial cell culture, bacterial transformation, replica plating, stock culture maintain.  
Bacterial growth curve, minimum inhibitory concentration (MIC) assay.

### ➤ **Molecular plant pathological techniques:**

Isolation of endophytic fungus from plant, study of host pathogen interaction, fungal behavior study on resistant and susceptible host surface.  
Fungal transformation.

### ➤ **Instrumentation:**

Microscope (light, stereo, electron, fluorescent, confocal), Centrifuge, Autoclave, Colorimeter, Spectrophotometer, Gel electrophoresis apparatus, Gel doc, UV illuminator, PCR, Nanodrop, microplate reader, Dynamic light scattering, Laminar air hood,

### ➤ **Computer proficiencies :**

Software: Primer 3, NCBI blast, Origin 6, Fluo-view, Image-j, Graph pad prism, Tritex100 (comet score).

Operating system: Windows-xp,10

- Techniques of isolation of symbionts and pathogens from soil and plant surfaces along with identification, characterization and maintenance of isolated fungal and bacterial cultures in pure form, maintenance of crop plants in pot culture and in field conditions.

- Good knowledge of plant microbe interactions in different ecological conditions in extreme environments and successfully developed a bioinoculum using AMF and bacterial strain beneficial for the plant growth in saline ecosystem.
- Isolation and culture of primary cells.
- Flow cytometry, HPLC, FTIR, XRD
- Establishing complex cell based assays
- Preparing protocols and lab reports for experiments
- Isolation Analysis, purification and localization of protein
- Trained in different molecular biology techniques including DNA and RNA isolation, cDNA preparation, qRT-PCR etc
- Extremely proficient in different types of microscopy: fluorescence, confocal, scanning electron microscopy, transmission electron microscopy and atomic force microscopy. □ Plant tissue culture and transgenesis, fungal transformation (mushroom) □ Therapeutic based mushroom study.
- Nanotechnology: Biosynthesis of nanoparticles and use of nanoparticles as vehicles of drug and gene delivery.
- Bioprocess Development, Bioremediation with mushrooms for petroleum industry, Molecular Biology and Enzymology
- Supervised several M.Sc Projects.
- Expertise in basic and applied aspects of microbiology, rhizospheric microbe interaction in extreme conditions and has gathered a good knowledge of microbial diversity, taxonomy, ecology and phylogeny with relation to molecular biology.
- Has very good communication skills and is good in English language.
- Quickly adapt new software programs.
- Have a good rapport with the lab mates and friendly with all the members of the research group □ Technical skills are exemplary and would be an asset to any organisation.
- Has several publications in national/international peer reviewed journals of high repute and **three** patents in nanotechnology.

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## WORK EXPERIENCE

- **2004 – 2009:** in developing bioinoculum for legume plants to sustain salinity in different environmental conditions at Department of Botany, Calcutta University. Works with other ecologists helping plan and undertake floral and geological surveys. Assists with planning and preparation of ecological surveys. Undertakes environmental surveys in support of a range of projects. Collates, writes up, and analyze ecological data for inclusion in environmental impact assessments and other ecology reports. Carries out background research in support of technical reports. Provides support to other team members on a range of tasks.
- **2004 – 2009: Worked as JRF and SRF in the project entitled: Microbial Retting of Jute** under DBT and **Jute Corporation of India**
- Government Sector experience in handling tasks like preparation/reviewing edited Journal of Mycopathological Research of India Mycological Society this is the second largest society of

mycologists in Asia. Gained experience of abstracting, indexing and classifying the articles received by the society for publication. Managing grants and donations to the Indian Mycological Society. Cultivating and sustaining professional relationships with prospective donors and organizations such as DBT, DST, ICAR, IARI etc      Helping to design fund raising pitches to a range of charitable donors.

- Relationship management with donors.
- Managing Editor of SPECRTUM: Journal of Science and Society for Sustainable Development
- **2012 -2017 Feb, worked as UGC post-doctoral fellow, Women Scientist on project entitled - Molecular characterization and genetic manipulation of economically viable mushrooms of West Bengal funded by UGC, Government of India.**
- **Giving training to the rural women of West Bengal for mushroom production to get health benefits and livelihood and promote balanced utilization and conservation of biodiversity and ecosystems.**
- **2012 –2017 Teaching MSc Students in Calcutta University during Post-doctoral Scientist tenure. Guided Ph.D students during their course work .**
- **2017-2019 Gained training on Mass production of agriculturally microorganisms in the bio fertilizer laboratory of the Department of Agriculture Microbiology, UAS, GKVK, Bangalore**

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## EDUCATIONAL CREDENTIALS

- Post-Doctoral Fellow (UGC): 10 February 2012 to 9 February 2017  
Title - Molecular characterization and genetic manipulation of economically viable mushrooms of West Bengal
- Ph.D. (Botany, Specialization: Microbiology, 2010) University of Calcutta.  
  
Title -Studies on some aspects of symbiotic association between *Rhizobium*-VAM fungi and legume plants in relation to salinity stress.
- **M SC in Botany, 2001**

Specialization: Microbiology, Bhagalpur University; Secured Third Rank T. M. Bhagalpur University; First Class, 68.25 %

- B.Sc in Botany, 1997

Secured Second Rank

T. M. Bhagalpur University; First Class, 71.75 %

- 12<sup>th</sup>, 1993

ISC; First division, 73.66 % Secured 2<sup>nd</sup> Rank

### Awards /Distinctions Received

- Distinction in Physics and Biology in 12<sup>th</sup> standard □ Distinction in Botany during B.Sc course.
- Distinction in M.Sc in Special paper: Microbiology
- First prize for poster presentation entitled “Microbial Retting of Jute” in International Symposium on Agriculturally Important Microorganisms: Conservation, Utilization, Bioremediation and Ecological Significance 23rd-25th February 2006. Organized by Indian Mycological Society, Department of Botany, University of Calcutta
- Gained several awards for Painting Competition and Music.

### Professional Memberships

- Life member of Indian Mycological Society.
- Life member of Vikramshila Science Academy □ Annual member of Botanical Society of Bengal.
- Indian Science Congress

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### SEMINAR/SYMPOSIUM ATTENDED & PRESENTED: NATIONAL/INTERNATIONAL:

- Attended National Symposium on Current trends in Research on Microorganisms. 15-16 February, 2003, Organized by Indian Mycological Society, Department of Botany, University of Calcutta.
- Attended 6th National Symposium on Microorganisms in Relation to Agriculture, Forestry and Industry 20th March, 2004, Organized by Indian Mycological Society, Department of Botany, University of Calcutta.
- **Presented** a paper entitled “Effect of VAM and *Rhizobium* inoculation on crop yield under salinity stress condition” in **International Symposium** on Agriculturally Important Microorganisms: Conservation, Utilization, Bioremediation and Ecological Significance 23rd-25th February 2006. Organized by Indian Mycological Society, Department of Botany, University of Calcutta.

- **Presented** a Poster entitled “Microbial Retting of Jute” in **International Symposium** on Agriculturally Important Microorganisms: Conservation, Utilization, Bioremediation and Ecological Significance 23rd-25th February 2006. Organized by Indian Mycological Society, Department of Botany, University of Calcutta.
- Attended National Symposium on Microbial Diversity and Plant Health 29th- 30th November, 2007. Organized by Department of Plant Pathology B.C.K.V, Mohanpur, Nadia, West Bengal and Indian Mycological Society, Department of Botany, University of Calcutta.
- Attended National Symposium on Microorganisms and their role in Plant and Human Affairs. 03-05 December 2009.
- International symposium on Microbes and human health, IMSS- 2014, February 19-21, 2014. Acted as rapporteur in session - III
- Attended Symposium on Insight to Plant Biology through Systems Approach, Organized by Division of Plant Biology, Bose Institute 17th December, 2015
- National symposium on (NS-2016) Microbial diversity and its Impacts February 18 – 19, 2016. Acted as rapporteur in the session - II Pathogenic microorganisms and their management
- International Conference on “The green planet: past, present and future” December 21 – 23, 2016. Presented a Poster entitled “Nanoparticles from filamentous fungi: synthesis, characterization and utilization vehicles of drug/gene delivery into Prokaryotic/eukaryotic cell. NICKY SINGH\*, MADHUSREE HALDER\*, NIBEDITA DAS\*, MAYUKH DAS\* and SUREKHA KUNDU\*#

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#### **PUBLICATIONS: National/International:**

- **N. Singh**, N. Samajpati and A. K. Paul, Physio-chemical characteristics of soils of coastal West Bengal. *Indian Agric.*, 52(1 & 2): 89-91, 2008
- **N. Singh**, N. Samajpati and A. K. Paul, Development of salt tolerant rhizobia for *Lathyrussativus* L. cultivation in coastal West Bengal. *J. Botan. Soc. Beng.*, 62 (2): 63-66, 2008.
- **N. Singh**, N. Samajpati and A. K. Paul, Screening of salt tolerant rhizobial isolates associated with *Vignaradiata* L. cultivated in saline soils of West Bengal. *J. Mycopathol. Res.*, 46 (2):239-243, 2008

- B. Bhaumik, **N. Singh** and N. Samajpati, Characterization of *Rhizobium* strains associated with *Cicerarietinum* grown in different agro climatic zones of West Bengal. *J. Mycopathol. Res.*, 44 (2): 305 – 310, 2006
- B. Bhaumik, **N. Singh** and N. Samajpati, Survival of *Cicer-Rhizobium* in soil. *J. Botan. Soc. Beng.*, 60 (1):38-43, 2006.
- R. Mukhopadhyay, **N. Singh** and N. Samajpati, Lignocellulolytic enzymes of *Pleurotussajor-caju*. *J. Botan. Soc. Beng.*, 59 (1&2):75-77, 2005.
- R. Mukhopadhyay, **N. Singh**, S. Kundu and N. Samajpati, Studies on some aspects of the release and regeneration of protoplast of *Pleurotussajor-caju*. *J. Botan. Soc. Beng.*, 63 (1): 57-60 (2009).
- **N. Singh**, N. Samajpati and A. K. Paul (2010) Legume-rhizobia-mycorrhiza symbiosis: A tripartite act for improvement of crops in saline soil ecosystems. Review article in *Agricultural Microbiology Ch-4*, pp-58-78: Pointer Publishers Jaipur (Raj) India.
- **N. Singh**, N. Samajpati and A. K. Paul (2011) Dual inoculation of salt tolerant *Bradyrhizobium* and *Glomusmosseae* for improvement of *Vignaradiata* L. cultivation in saline areas of West Bengal, India. *Agricultural Sciences*, Vol.2, No.4, 413-423 (2011)
- C. Bhattacharya, **N. Singh**, S. Kundu and N. Samajpati , Antibiotic activity of some higher fungi used by tribal people of Tripura. *J. Botan. Soc. Bengal.* 65 (1): 75-78 (2011).
- International Conference on “The green planet: past, present and future” December 21 – 23, 2016. Presented a Poster entitled “Nanoparticles from filamentous fungi: synthesis, characterization and utilization vehicles of drug/gene delivery into prokaryotic/eukaryotic cell. NICKY SINGH\*, MADHUSREE HALDER\*, NIBEDITA DAS\*, MAYUKH DAS\* and SUREKHA KUNDU\*\*

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## **Patents:**

1. Application No.1443/KOL/2012; Date of filing of Application: 21/12/2012:

**Date of Grant: 27/08/2021**

**Title of the invention: Process for preparation of silver nanoparticles using edible mushroom *Pleurotus florida***

2. Application No.521/KOL/2015; Date of filing of Application: 13/05/2015:

**Publication Date: 21/03/2017**

**Title of the invention: SYNTHESIS OF VESICULAR PLATINUM NANOPARTICLES USING EDIBLE MUSHROOM.**

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### **Trainings:**

1. 5 day online training programme **mushroom cultivation** from 5-9th April, 2021 organised by CMR-DMR, Solan (HP)
2. Training on **HYDROPONICS** in vegetables, flowers and medicinal crops on 31st July 2021 at ICAR-Indian Institute of Horticultural Research Bengaluru – 560089
3. Online course on Responsible **Artificial Intelligence (AI)** from 5th April to 31st May 2021. Organized by PKC in partnership with Persistent System, Pune.
4. Online course on on '**UNDERSTANDING AND EXPLORING EPIDEMIOLOGY**' from 20th July to 27th August 2021. This course is in collaboration with the Savitribai Phule Pune University