Minni Singh, PhD

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DOB: March 14, 1976

PROFESSIONAL EXPERIENCE

Assistant Professor of Biotechnology at Punjabi University Patiala, India (January 2004-present).

Teach the following subjects to PhD and Masters' courses: Nanotechnology, Food Biochemistry, Food Engineering, Fruit Vegetable and Cereal Technology, Total Quality Management.

Post doctoral fellow Department of Instrumentation and Applied Physics, Indian Institute of Science, Bangalore, India (2008-10: availed study leave)

AREA OF RESEARCH

- Investigation of carbon based nanomaterials for enhanced electrochemical detection for biosensor applications.
- Investigation of aptamers and riboswitches as biorecognition elements for ultrasensitive detection of target analytes.
- Nutraceutic nanoemulsions for value addition in foods.

PATENTS

1. **Singh, M.,** Verma, N. Thakkar, V.: A disposable microbial based colorimetric urea biosensor. Submitted as: Indian Patent: (Application No1871/DEL/2008, application date 08, 2008).

2. Verma, N., **Singh, M**. (2006): A novel *Bacillus sphaericus* strain, a device comprising the said strain and a method for detecting copper in industrial effluents using said device. Indian Patent (Patent No 197519).

EDUCATION

Department of Biotechnology, Punjabi University

2003 PhD in Biotechnology
1999 MSc in Microbial and Food Technology, distinction in major.

ADMINISTRATIVE EXPERIENCE

- Member, Academic Committee of Department, Department of Biotechnology, Punjabi University Patiala, 2004-present.
- Member, Board of Studies, Department of Biotechnology, Punjabi University Patiala, 2004-present.
- Incharge, functional committees of Department of Biotechnology, Punjabi University Patiala, 2004- present.
- In-plant training and Placement Incharge, Faculty of Life Sciences, Punjabi University Patiala since 2006.

- President, Biotechnological Society, Department of Biotechnology, Punjabi University Patiala, 2007.
- Organizing Secretary, National Seminar on Genetically Modified Foods: a current scenario, January 2012.

AWARDS AND FELLOWSHIPS

2012 *R Chandrashekhar Memorial Award* for Best Industry Oriented Research work

2008-10 *DBT post doctoral fellowship*, Ministry of Science and Technology, Govt. of India
Department of Instrumentation and Applied Physics, Indian Institute of Science, Bangalore, India *Studies on Polypyrrole as a Matrix for Biosensor Applications*

2002-03 *SRF-CSIR*, Ministry of Science and Technology, Govt. of India
Department of Biotechnology, Punjabi University, India *Recombinant Microbial Biosensor based on an Amperometric Transducer for the Detection of Mercuric Ion Toxicity in Industrial Samples*

2003 *Young Scientist Award* Punjab Academy of Sciences

1999-2002 *JRF-AICTE, Ministry of Technical Education, Govt. of India*
Department of Biotechnology, Punjabi University, India

1999 *University Medal* for distinction in Master of Science

1999 *First Position* in Scientinalia, Punjab Academy of Sciences

RESEARCH PROJECTS

Biosensor for 2-Chloroethyl Ethyl Sulfide (CEES) – Analog of sulfur mustard, a chemical warfare agent (No.:DRDE-P1-2010/Task-163), funded by Defense Research and Development Establishment, Ministry of Defense, Govt. of India, February 2011-2013 : 6.0 lakh INR.

Agrowaste utilization: extraction of nutraceutic β- cryptoxanthin from mandarin processing wastes and its conversion into aqueous dispersible nanoemulsions for value addition of foods, approved for funding by Department of Science and Technology, Ministry of Science and Technology, Govt. of India : 40.0 lakh INR.

PUBLICATIONS

1. **Singh, M.** (2014): Arsenic Biosensors: challenges and opportunities for high throughput detection. In: Handbook of Arsenic Toxicology. Precontract with: Elsevier Publishers, Massachusetts.

2. Kaur, S., **Singh, M**., Flora S.J.S. (2013): Quenching action of monofunctional sulfur mustard on chlorophyll fluorescence: towards an ultrasensitive biosensor *Appl Biochem Biotechnol* 171(6), 1405-11.

3. Kaur, H., Kaur, S., S**ingh, M.** (2013): Biosynthesis of silver nanoparticles by natural precursor clove and their antimicrobial activity *Biologia* 68(6), 1048-53.

4. Sharma, R., Uppal, S., Singh, M. and Sharma, D. (2013): Nanoemulsions of beta- carotene, a nutraceutic derived from waste of *Daucus carota* for application in the food industry. In:

Emerging paradigms in nanotechnology, Eds. Sobti, R. C., Kaushik, A., Singh, B. and Tripathi, S. K. Pearson Publishers New Delhi, 859-867. ISBN 978-81-317-8991-9.

5. Kaur, B., Markan, M., **Singh, M.** (2012): Green synthesis of gold nanoparticles from *Syzgium aromaticum* extract and its use in enhancing the response of a colorimetric urea biosensor *BioNanoSc* 2, 251-258.

6. Kaur, S., **Singh, M.,** Verma, N. (2012): Chlorophyll based biosensor for sulfur mustard-the chemical warfare agent *IEEE ,* 87-91.

7. **Singh, M.** (2011): Biosensors for food safety: an overview. In: Bioprocessing of foods, Eds. Panesar, P.S., Sharma, H.K., Sarkar, B.C. New Delhi. Asiatech Publishers Inc, 181-190. ISBN 81-87680-X-27.

8. **Singh**, **M**., Kathuroju, P.K., Nagaraju, J. (2009): Polypyrrole based amperometric glucose biosensors *Sens Actuators B* 143(1), 430-443.

9. **Singh**, **M**., Verma, N., Garg, A.K., Redhu, N. (2008): Urea biosensors *Sens Actuators B* 134, 345-351.

10. Verma,N., **Singh, M.** (2006): A *Bacillus sphaericus* based biosensor for monitoring nickel ions in industrial effluents and foods *J Aut Meth Mgt Chem* 83427, 1-4.

11. Verma,N., **Singh, M.** (2005): Development of a yeast biosensor for monitoring mercuric ions in industrial effluents. *Int J. Env Studies* 62(1), 3-3.

12. Verma, N., **Singh, M.,** Kumar, V. (2005): Development of an enzyme- based biosensor for monitoring copper ions in industrial effluents and food samples *Chem Env Res* 14(1&2), 53-58.

13. Verma, N., **Singh, M.** (2005): Biosensors for heavy metals. *Biometals* 18 (2), 121-129.

14. Verma, N., **Singh, M.** (2003): A disposable microbial based biosensor for quality control in milk. *Biosens Bioelectron* 18, 1219-1224.

Manuscripts communicated

Kaur, S, **Singh, M.** (2014): Nanoporous glassy green optical biosensor for chemical warfare agent sulfur mustard *Biosens Bioelectron*
Bansal, A., Markan, M., **Singh**, **M.,** Kumar, S., Nagaraju, J. (2014): Amperometric urea biosensor based on urease entrapped in a polypyrrole film *Bioelectrochem*

Markan, M., **Singh, M.** (2014): Insulin like Growth Factor 1: Incidence and analytical approaches *BioTechniques*

CONFERENCE PRESENTATIONS and INVITED LECTURES

1. *Nanotechnology in diagnostics*, invited presentation at the Sixth National Conference on Recent Advances in Chemical and Environmental Sciences RACES, Patiala- India, 2013.

2. *Chronoamperometric urea detection based on urease entrapped in a polypyrrole film*, Fifth International Conference on Electroactive Polymers: Materials and Devices ICEP, Banaras Hindu University, Varanasi-India, 2012.

3. *Biosensors and their potential applications in ascertaining quality control*, invited presentation at National Dairy Research Institute, Karnal- India, 2011.

4. *Bimetallic nanoparticle-polypyrrole nanocomposite for electrochemical glucose biosensor,* International Conference on Nanomaterials and Nanotechnology ICNANO, New Delhi-India, 2011.

5. *Biosensors for food safety: an overview*, invited presentation at a National Conference on New Horizons in Bioprocessing of Foods-NHBF, Longowal-India, 2011.

6. *Biosensors-a foray into sensing explosives*, invited presentation at Defense Research and Development Establishment, Ministry of Defense, Gwalior- India, 2010.

7. *Nanomaterials for electrochemical biosensors*, invited presentation at the Second International Conference on Natural Polymers ICNP, Kottayam-India, 2009.

8. *An Enzyme based colorimetric urea biosensor for quality control in milk*, a presentation at The Pittsburgh Conference at Orlando, Florida-USA, 2006.

9. *Metal biosensors*, invited presentation at Continuing Education Program on Role of Toxic Metals in Defense Electronics and their Safety, Defense Research and Development Organization, Gwalior-India, 2005.

10. *Urease enzyme as an analytical tool for biosensing of Cu(II) ions*, a presentation under the Young Scientist Award Category, the Indian Science Congress, Chandigarh-India, 2004.

11. *Microbial based potentiometric biosensor for monitoring Pb(II),* a presentation at the Punjab Science Congress, Longowal-India, 2003.

THESIS SUPERVISION

PhD thesis under supervision: 03

1. Simerjit Kaur, "Biosensors for mono-functional sulfur mustard: fluorescent and electrochemical approaches", *ongoing*.

2. Ashish Kumar Singh, "Electrochemical biosensors for the detection of urea and L-arginine in milk, juices and clinical samples", *ongoing*.

3. Navpreet kaur, "Systematis studies on family Hymenochaetaceae from Himachal Pradesh and evaluation of antioxidative potential of some selected taxa", *ongoing*.

MSc thesis supervised: 40 (ongoing: 05)

Research topics span from biosensor development for food safety: melamine and urea, chemical warfare agents: sulfur mustard, food biochemical analytics, nanopreparations: nanoemulsions and solid lipid nanoparticle of nutraceutic nutraceutic compounds for value addition of foods.

WORKSHOPS AND TRAININGS

Advanced techno-management programme for women scientists, Management Development Institute. Gurgaon-2014.

Practical aspects on the importance of patents in research, Intellectual Property Rights Cell, Punjabi University Patiala-2013.

Smart Technologies in Educatio, Academic Staff College, Punjabi University Patiala, 2013.

Indo-Italian workshop on food biotechnology: industrial processing, safety and health, Biotechnology Research Society of India, Punjabi University Patiala-2012.

Immobilized enzyme technology for sensors, Maharishi Dayanand University, Rohtak-2007

Patent Awareness Workshop, Punjab State Council for Science and Technology, Chandigarh-2007.

Computational biochemistry, Himachal Pradesh University, Simla- 2006

Prospects of biosensors in modern biology and biotechnology applications, Panjab University, Chandigarh-2004

Patent Awareness Workshop, Central Research Institute, Patiala-2004.

Microbial Technology: emerging trends in bio-analytical techniques, Thapar Institute of Engineering and Technology, Patiala-2003.

Recent food laws, food safety and opportunities for small and medium scale food processors, Centre of Relevance and Excellence in Agro and Industrial Biotechnology, Thapar Institute of Engineering and Technology, Patiala-2002.

Genomics and Proteomics, Institute of Microbial Technology, Chandigarh-2001.

Public Domain Resources in Biology, Institute of Microbial Technology, Chandigarh-2000.

Patent Awareness Workshop, Sant Longowal Institute of Engineering and Technology, Longowal-2000.

Plasmid Stability oin Fermentations, Institute of Microbial Technology, Chandigarh-1998.

PROFESSIONAL SERVICE

Manuscript Reviewer for
Biosensors and Bioelectronics, Materials Science and Engineering B, Synthetic Metals, Process Biochemistry, Indian Journal of Clinical Biochemistry

MISCELLANY

- Conduct yoga workshops
- Organize sessions in Indian Vedic Literature
- Sponsor education for underprivileged children

References

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