

Minni Singh, PhD

Professor

(Specialization: Functional foods; Agrowaste Utilization; Product Development, and Food Analytics)

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PROFESSIONAL EXPERIENCE

National Coordinator, e-pg pathshala, a UGC program, for the paper on Nanobiotechnology, under the National Mission in Education through ICT, MHRD, Govt. of India.

Coordinator, Open Learning Program in Entrepreneurship (at Punjabi University) under the aegis of Entrepreneurship Development Institute of India, Ahmedabad.

Member, State Level Approval Committee-Punjab under PM FME Scheme (Formalization of Micro Food Processing Enterprises).

Resource person and Reviewer: National and International conferences, and journal articles.

AREA OF RESEARCH

- Developing food formulations and study of bioactive release behaviors.
- Agrowaste utilization for value addition.
- Food analytics.

TECHNOLOGIES TRANSFERRED TO INDUSTRY and COMMERCIALIZED

- *Bioengineered Aqueous Dispersible Turmeric Derived Formulations*: a technology transferred to Bara BioFoods Pvt. Ltd., Mohali, on May 08, 2020, commercialized as Haldi Dudh of Verka, the milk cooperative of Punjab.
- *A Bioengineered Aqueous Dispersible Formulation derived from Kinnow processing wastes as a poultry feed supplement*: a technology developed in collaboration with Punjab Agro Juices Ltd., Chandigarh, and transferred to Juggernaut Hospitality Services, Pune, on June 11, 2020.

PATENTS

1. **Singh, M.**, Bawa, M. Pannu, K. S. (2017): A bioengineered nutraceutical product from kinnow processing wastes. Indian Patent granted; Patent number.: 421924.
2. **Singh, M.**, Verma, N. Thakkar, V. (2008): A disposable microbial based colorimetric urea biosensor. Indian Patent granted; Patent number 315655.
3. 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 granted; Patent number 197519.

RESEARCH PROJECTS

- Development and toxicological evaluation of nano-nutraceuticals derived from kinnow peels, sponsored by Punjab Agro Juices Ltd., Govt. of Punjab, 2016-2020: 37.78 lakh INR.
- Agrowaste utilization: extraction of nutraceutical β - cryptoxanthin from mandarin processing wastes and its conversion into aqueous dispersible nanoemulsions for value addition of foods, Department of Science and Technology, Ministry of Science and Technology, Govt. of India, 2015-17 : 40.0 lakh INR.

- 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, 2011-2013 : 6.0 lakh INR.

PUBLICATIONS

1. Kaur, H. and Singh, M. (2023) Functional foods as immunomodulators: tackling the SARS-CoV2 related cytokine storm- a review. *Food Chem Adv* 3: 100407.
2. Kaushal, N., **Singh, M.** (2023) Food grade hydrogels fabricated using hybrid matrices as carriers of bioflavonoids derived from 'kinnow' mandarin peels. *Waste and Biomass Utiliz* <https://doi.org/10.1007/s12649-023-02178-5>.
3. Himshweta and **Singh, M.** (2023) Nanosensor platforms for detection of milk adulterants. *Sens and Actuators Reports* 5: 100159.
4. Kaushal, N., **Singh, M.** (2023) Fabrication and characterization of a bilayered system enabling sustained release of bioflavonoids derived from mandarin biomass. *Food Hydrocoll for Health* 3: 100114.
5. Himshweta, **Singh, M.**, Verma, N., Trehan, N. (2023) Identification of Chlorogenic Acid from *Morus alba* Leaves by UV-Vis Spectroscopy, FTIR, UPLC-QTOF-MS and Quantification by HPTLC. *Comm Soil Sc and Plant Anal* 54(6): 706-722.
6. **Singh, M.** del Valle, M. (2023): Arsenic Biosensors: challenges and opportunities for high throughput detection. In: Handbook of Arsenic Toxicology, Ed S.J.S. Flora. 2nd edition, Academic Press pp. 649-665.
7. Kaushal, N., **Singh, M.**, Sangwan, R.S. (2022) Flavonoids: Food associations, therapeutic mechanisms, metabolism and nanoformulations. *Food Res Intl* 157: 111442
8. Garg, D., **Singh, M.**, Verma, N. (2022) Review on recent advances in fabrication of enzymatic and chemical sensors for hypoxanthine. *Food Chemy* 375: 131839.
9. Singh, A.K., Sharma, R, **Singh, M.** and Verma, N. (2020) Electrochemical determination of L-arginine in leukemic blood samples based on polyaniline- multiwalled carbon nanotube-magnetite nanocomposite film modified glassy carbon electrode *Instr Sc Tech* 48(4), 400-416.
10. Kaur, N., Kaushal, N., **Singh, M.**, Singh A. P. and Dhingra, G. S. (2019) Investigations on Antioxidative Potential of Poroid Medicinal Mushroom *Porodaedalea pini* (Agaricomycetes) *Int J Med Mushrooms* 21(6): 549-559.
11. Singh, A.K., Verma, N. and **Singh, M.** (2019) Electrochemical preparation of Fe₃O₄/MWCNT-polyaniline nanocomposite film for development of urea biosensor and its application in milk sample 13(3), *J Food Meas Ch*, 1-13.
12. Singh, A. K., Verma, N, **Singh, M.** (2017) L-arginine biosensors: a comprehensive review *Biochem Biophy Reports* (12), 228-239.
13. Singh, A. K., Verma, N, **Singh, M.** (2017) Extraction, purification, kinetic characterization and immobilization of urease from *Bacillus sphaericus* MTCC 5100 *Biocat Agri Biotech* (12), 341-347.
14. Kaushal, N., **Singh, M.** (2016) Valorizing citrus byproducts by exploring bioactives from agrowaste *J Pb Acad Sc.* 15-16 (1&2), 7-9.
15. Kaur, B., Markan, M., **Singh, M.** (2012) Green synthesis of gold nanoparticles from *Syzygium aromaticum* extract and its use in enhancing the response of a colorimetric urea biosensor *BioNanoSc* 2, 251-258.
16. Kaur, S., **Singh, M.**, Verma, N. (2012) Chlorophyll based biosensor for sulfur mustard-the chemical warfare agent *IEEE* , 87-91.
17. **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.

18. **Singh, M.**, Kathuroju, P.K., Nagaraju, J. (2009) Polypyrrole based amperometric glucose biosensors *Sens Actuators B* 143(1), 430-443.
19. **Singh, M.**, Verma, N., Garg, A.K., Redhu, N. (2008) Urea biosensors *Sens Actuators B* 134, 345-351.
20. 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.
21. 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.
22. 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.
23. Verma, N., **Singh, M.** (2005) Biosensors for heavy metals. *Biometals* 18 (2), 121-129.
24. Verma, N., **Singh, M.** (2003) A disposable microbial based biosensor for quality control in milk. *Biosens Bioelectron* 18, 1219-1224.

EDUCATION

2019-Certificate course in Entrepreneurship; Entrepreneurship Development Institute of India, Ahmedabad.

2010-Post doctoral fellowship at Department of Instrumentation and Applied Physics, Indian Institute of Science, Bangalore, India (*availed study leave; 2008-2010*).

2003-PhD Biotechnology; Department of Biotechnology, Punjabi University, Patiala.

1999-MSc Microbial and Food Technology, Department of Biotechnology, Punjabi University, Patiala; *with distinction in major*.

AWARDS AND FELLOWSHIPS

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| 2017 | <i>Best Paper Award</i> at 5 th International Conference on “Food, Chemical, Biological and Healthcare Sciences, Bangkok, Thailand. |
| 2012 | <i>R Chandrashekar Memorial Award</i> for Best Industry Oriented Research work. |
| 2008-10 | <i>DBT post doctoral fellowship</i> , Ministry of Science and Technology, Govt. of India
Department of Instrumentation and Applied Physics, Indian Institute of Science, Bangalore, India <i>Studies on Polypyrrole as a Matrix for Biosensor Applications</i> |
| 2002-03 | <i>SRF-CSIR</i> , Ministry of Science and Technology, Govt. of India
Department of Biotechnology, Punjabi University, India <i>Recombinant Microbial Biosensor based on an Amperometric Transducer for the Detection of Mercuric Ion Toxicity in Industrial Samples</i> |
| 2003 | <i>Young Scientist Award</i> Punjab Academy of Sciences |
| 1999-2002 | <i>JRF-AICTE</i> , Ministry of Technical Education, Govt. of India
Department of Biotechnology, Punjabi University, India |
| 1999 | <i>University Medal</i> for distinction in Master of Science |