



DR. RAGHUNANDAN DESHPANDE

M Pharm., PhD

Professor & Head of the Department

Department of Pharmaceutical and Nano Chemistry,

Ex-Member Academic Council, RGUHS, Bangalore

Ex-Member, Board of Studies, RGUHS, Bangalore

EX-Member, Board of Studies, Adichunchanagiri University, Mandaya

Post-doctoral Research mentor (DST-SERB), Principal collaborator (BRNS-DAE)

OBJECTIVES

The main objective is to design and optimize the nanomaterials developed through green chemistry principles. To understand also the properties offered by these nanoparticles synthesized using different microorganisms, plant extract and bio-excretory for pharmaceutical and medical, agrarian, scientific, and industrial application. The very aim of my work is to design highly human compatible 'clean- green' nanoparticles for application in drug delivery with high benefit to risk index.

QUALIFICATION

M. Pharmacy (Advanced Pharmaceutical Chemistry), 68%, RGUHS, Bangalore

PH.D. thesis entitled 'Silver Nanoparticles as Drug Delivery Systems' from Jawaharlal Nehru Technical University (JNTU), Hyderabad, AP), INDIA

Work Highlights: Advancement of treatment of diseases in pharmaceutical and medical field is the result of nanotechnology which is a burgeoning arena with a myriad of prospects and possibilities. The amalgamation of this nanotechnology with biotechnology into controlled design of functional nanomaterials became possible, by mimicking nature, assuming that biological system is an organized network framed naturally with nanomaterials, and hence man-made nanostructures can become biocompatible. Encouraged by this philosophy, pathway of natural nanomaterial manufacturing and the properties offered by these, in our advanced research we have synthesized bio-shell-metal-core nanoparticles using different microorganisms, plant extract and bio-excretory as reducing agents. Treatment of the different natural reducing agent with the aqueous solution of noble metal salt produced functionalized nanoparticles of core- shell morphology regulating the composition and dimension.

CITATIONS

<https://scholar.google.com/citations?user=x4cjUPcAAAAI&hl=en> h-index-19, i10-index-22, g-index-29, RG index-25, Citations-2500.



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Institute of Pharmaceutical

Sciences, Mahadevappa Rampure Marg,

Sedam Road, Gulbarga-585105,

Karnataka.

Honours

Karnataka State Young Scientist
Award: Seed Money to Young
Scientists, Stable Biocompatible
Noble Metal & Metal Alloy
Nanoparticles preparations for
Quicker, Safer, Better & Empiric
Wound Healing Treatment, 4.00
Lakhs/2012

Star Teacher & researcher
Award 2023: Awarded as
STAR teacher and
researcher by American
Association of Government
college of Pharmacy
HKE Society Best Teacher
Award: 2022

Hyderabad Karnataka
Excellency award for best
researcher 2022 from RMES and
KSPC, Karnataka. 2022

Funding agencies for the work

V G S T (D 38/7) , BRNS (Grant No. No. 2009/34/BRNS), DST (Grant No.SR/S1/PC-10/2005), UGC (D.O.No.F.14-4/2001 (Innov. Policy/ ASIST). Advance research grant from RGUHS, Bangalore (P-007), SERB Science & Engineering Research Board 'SERB' - 'India' (PDF/2016/003910)

Practical Skills

1. Nanomaterials synthesis especially, Ag, Au, Pt, Cu and Si nanoparticles.
2. Handling of UV-visible, FTIR, HPLC, AFM, TGA-DSC, DLS, TEM, FESEM instruments.
3. Handling of in vitro bacterial and cancer cell cultures.
4. Computer Skills: Office, Pascal, FORTRAN, Photoshop, Origin, Chemcad and other related software.

Work Experience

1. July 2007-till date, Lecturer and HOD, HKES's College of Pharmacy, Gulbarga
2. Jan 2006 - June 2007, Lecturer, RMES's College of Pharm., Gulbarga
3. August 2004 - December 2006, Area Sales Manager, Nicholas Piramal India Ltd., Mumbai Jan
4. November 2002 - July 2004, Area Sales Manager, Alkem Ltd., Mumbai
5. 2001- Sept 2002, Area Sales Manager, Micronova Ltd., (Division of Microlabs), Bangalore

Personal Information

Father's Name : Jagannathrao M. Deshpande

Date of Birth & Age : 21/08/1973 & 49 Years

Marital Status : Married

Languages Known : Kannada, Hindi, English and Telugu

Permanent Address : # 98, NGO Colony, New Jewargi Road, Behind over bridge, Opp Sevalal Temple

Gulbarga- 585015, Karnataka (INDIA)

Patents Applied

1. Processes for producing metal nanoparticles from bio-excretory materials (Patent No. E-2/3104/2018-CHE, 201841038373) 2018.
2. The process for using metal/ metal alloy nanoparticles as novel anti-sprouting agents (Patent No. 1170/CHE/2012)/2012.
3. Processes for producing metal nanoparticles from different metal salt solution using milk and milk preparation as a reducing medium (Patent No 1494/che/2010, 25/2010, Int: A61K 33/38 25) /2010
4. Conventional or microwave induced processes for producing metal nanoparticles from cow urine. (Patent No. 719/che/2010, No. 17/2010, Int: A61K 9/14)/2010.

Number of Research Students

M. Pharmacy	04
PhD	04
Post doc fellows completed	01

Ongoing Projects

1. Post-doctoral Research mentor. Science & Engineering Research Board (PDF/2016/003910).
2. Rajiv Gandhi University of Health Sciences 'RGUHS', Bengaluru-'India' (Advance Research Grant - P007/2016-17).

Administrative Designations

1. Head of the Department : Professor and HOD, Department of Pharmaceutical and Nano Chemistry, H.K.E.S's Matoshree Taradevi Rampure Institute of Pharmaceutical Sciences
 2. Board of Studies Member for Post Graduation: Rajiv Gandhi University of Health Sciences
 3. Board of Studies Member for Adichuchanagiri University, Faculty of Pharmacy.
 4. Board of Studies Member for Sharanabasav University. Kalaburagi
- Academic Council Member: Rajiv Gandhi University of Health Sciences

Publications

1. Reproductive and developmental toxicity of triclosan (TCN) in wistar Rats. Malashetty VB, Biradar PM, Deshpande R, Hegde SS, Nagabhushan C. Austin journal of environmental toxicology 2021, 7(2), pp 08
2. Interfacial synthesis of polyaniline-(Ag-Au) alloy nanocomposite. MD. Bedre, V. Malashetty, Deshpande R, Basavaraja, S. Ganiger A. Lagashetty. Phys. Chem. Res. 2022, 10(2), 273-281, doi: 10.22036/pcr.2021.277674.1897
3. Pharmacokinetics of bio-shell-silver-core nanoparticles (AgNP) in sprague-dawley rats - in vivo Study. Parveen A, Malashetty VB, Marla S, Reddy S, Sirsand SS, Yalagatti M, Abbaraju V, Deshpande R. 2021, 9(3) 191-199. doi:10.2174/2211738509666210319162415.
4. Rapid and easy identification of genes associated with nanoparticles from plant protein structure database. Parveen A. Malashetty VB, Shetty PR, Patil V, Deshpande R. OpenNano, 8, 2022, 100071.
5. Preparation, characterization and thermal studies of polypyrrole - gold nanocomposites. Bedre MD, Malashetty VB, Venkataramana A, Inamdar S, Deshpande R. Current Applied Polymer Science, 2022,5(3), 212. doi: 10.2174/2452271605666220820124619

6. Seventy-day toxicity study in juvenile sprague-dawley rats with semicarbazide (SEM) from weaning to sexual maturity. Malashetty V, Deshpande R, Patil S. *Journal of Toxicology*. 2022, Article ID 5059761, 13 doi: [org/10.1155/2022/5059761](https://doi.org/10.1155/2022/5059761)
7. Bio-functionalized corona nanoparticles as drug delivery systems. Parveen A, Marla S, Bendegumble B, Kodli MV, Rampure M, Deshpande R. *Manipal journal of pharmaceutical sciences* 2018, 5(1), 39-44.
8. In vivo efficacy of biocompatible silver nanoparticles cream for empirical wound healing. Parveen A, Neha Kulkarni N, Manjunath Yalagatti M, Venkataraman Abbaraju V, Deshpande R. *Tissue Viability*. 2018, 27(4), 257-261. <https://doi.org/10.1016/j.jtv.2018.08.007>
9. Emphasized mechanistic antimicrobial study of biofunctionalized silver nanoparticles on model *Proteus mirabilis*. Parveen A, Yalagatti MS, Abbaraju V, Deshpande R. 2018 ID: 3850139.
10. Phytosynthesis and characterization of noble metals nanoparticles. Parveen A, Rao S, Deshpande R. Lambert Academic Publishing, Mauritius, 2018. ISBN. 978- 613-981495-4.
11. Bio-functionalized gold nanoparticles: Benign effect in Sprague-Dawley rats by intravenous administration. Parveen A, Malashetty V, Mantripragada B, Yalagatti M, Abbaraju V, Deshpande R. *SaudiJournalofBiologicalSciences*.2017, 24(8), 19251932 doi: 10.1016/j.sjbs.2017.11.041
12. Silver and gold nanoparticles as drug delivery systems Book. Deshpande R, Yalagatti M, Abbaraju V. May 2016 ISBN 978-3-659- 52767-8 Publisher: Lambert Publications
13. Biosynthesis of noble metal nanoparticles: from synthesis to applications. Deshpande R, Bhat R, Bendegumble B, Abbaraju V. 2014, 3(3), 217-230 doi: 10.1166/rase.2014.1065
14. Photo-bio-synthesis of irregular shaped functionalized gold nanoparticles using edible mushroom *Pleurotus florida* and its anticancer evaluation. Bhat R, Sharanabasava VG, Deshpande R, Shetti U, Sanjeev G, Venkataramana A, J. *Photochemistry and PhotobiologyB:BiologicalSciences*2013,125,63-69.doi: 10.1016/j.jphotobiol.2013.05.002 IF: 3.11
15. Microscopic and dielectric studies of ZnO nanoparticles loaded in orthochloropolyaniline nanocomposites. Roy A, Parveen A, Deshpande R, Bhat R, Koppalkar A. *Journal of nanoparticle Research* springer 2013;15(1): 1- 11. Doi 10.1007/s11051-012-1337-z IF:2.175
16. Rapid biosynthesis of silver nanoparticles using areca nut (*Areca catechu*) extract under microwave- assistance. Bhat R, Ganachari S, Deshpande R, Ravindra G, Venkataraman A. *J. Cluster Science*. Springer 2013; 24(1) 107-114. doi: 10.1007/s10876-012- 0519-2
17. Synthesis, characterisation, and DC conductivity of polyaniline-lead oxide composites. Parveen A, Deshpande R, Ahmed S, Roy AS. *Chemical Papers*. Versita (Springer) 2013, 67(3), 350-356 doi: 10.2478/s11696-012-0270-z IF:0.879

18. Synthesis, characterization and studies of PANI-MMT nanocomposites. Pande S, Swaruparani H, Bedre MD, Bhat R, Deshpande R, Venkataraman A. *Nanoscience and Nanotechnology Scientific and Academic* 2012, 2(4), 90-98. Doi: 10.5923/j.nn.20120204.
19. Microwave assisted rapid biosynthesis of stable silver nanoparticles using clove buds (*Syzygium aromaticum*) solution. Deshpande R, bedre MD, Salimath B, Balaji S, Manjunath SY, Venkataraman A. *Nano Life World Scientific* 2012, 2(2); 1250012. doi: 10.1142/S1793984411000499
20. Extracellular biosynthesis of silver nanoparticles using Fungi *Penicillium diversum* and their antimicrobial activity studies. Ganachari, S, Bhat R; Deshpande R, Venkataraman, A. *BioNanoScience Springer* 2012, 2(4), 316-321 doi: 10.1007/s12668-012-0046-5
21. Preparation and characterization of polyaniline-Co₃O₄ nanocomposite via interfacial polymerization. Bedre MD, Deshpande R, Salimath B, Venkataraman A, *American Journal of Materials Science*, 2012 ; 2(3): 39-43. doi: 10.5923/j. Materials. 20120203.
22. Microwave-assisted synthesis and pharmacological activity of pyrazolyl benzofuran derivatives. Raghunandan D, Bhagawanraju M, Parameswar S, Shant Kumar SM, Appalaraju S, Manjunath SY. *American Journal of Chemistry Scientific and Academic* 2012, 2(3), 115- 120. doi: 10.5923/j. chemistry. 20120203.03
23. Use of liquid-liquid interface for synthesis of maghemite nanocrystals. Basavaraja, S, Sawle BD, Bedre BD, Raghunandan D, Arunkumar L, Vijayanand H, Venkataraman A. *Surface review and letters World Scientific* 2012, 19 (02), pp. 8, 1250019. doi: 12500191-1250019-8.
24. In vitro production of cucurbitacins from *trichosanthes cucumerina* L. Var. *Cucumerina*. Devendra NK, Attard EG, Raghunandan D, Seetharam YN. *Advances in Life Sciences* 2012, 2(4), 108-111 doi: 10.5923/j.als.20120204.05
25. Synthesis and characterization of nickel oxide nanoparticles by self-propagating low temperature combustion method. Ganachari SV, Bhat R, Deshpande R, Venkataraman A. *Recent Research in Science and Technology* 2012, 4(4), 50-53
26. Biosynthesis and characterization of silver nanoparticles using extract of fungi *Acremonium diospyri*. Bhat R, Ganachari SV, Deshpande R, Bedre MD, Venkataraman A. *International Journal of Science Research*. 2012, 4(1), 1- 17.
27. Large scale synthesis and characterization of γ -Fe₂O₃ nanoparticles by selfpropagating low temperature combustion method. Ganachari SV, Venugopal K. Joshi VK, Bhat R, Deshpande R, Salimath B, Rao NVS, Venkataraman A. *International Journal of Science Research* 2012, 1(2), 77-79 (CNR Rao Special Edition)
28. Microwave-assisted rapid extracellular synthesis of stable bio-functionalized silver nanoparticles from guava (*Psidium guajava*) leaf extract. Raghunandan D. Mahesh MD, Basavaraja S, Balaji SD, Manjunath SY, Venkataraman A. *Journal of Nanoparticles Research springer* 2011, 13 (5), 2021-2028. doi: 10.1007/ s11051-0109956-80 IF: 2.175 29. A

29. Anti-cancer studies of noble metal nanoparticles synthesized using different plant extracts. Raghunandan D, Bhat R, Ganachari S, Bedre MD, Harsoor V, Manjunath SY, Bhagawanraju M, Venkataraman A *Cancer Nanotechnology* Springer 2011, 2(1-6), 57- 65. doi: 10.1007/s12645-011-0014-8
30. Microwave-assisted rapid extracellular biosynthesis of silver nanoparticles using carom seed (*Trachyspermum copticum*) extract and in vitro studies. Deshpande R, Borgaonkar PA, Basawaraj Bendegumble B, Bedre MD, Bhagawanraju M, Manjunath SY, Huh DS, Abbaraju V. *American Journal of Analytical Chemistry*, 2011, 2, 475- 483. doi: 10.4236/ajac.2011.24057
31. Study on Seasonal variation of the content of cucurbitacin of various vegetative parts of *trichosanthes cucumerina* L. Var. *Cucumerina*. Devendra NK, Attard EG, Deshpande R, Seetharam YN. *International Journal of Plant Research*. 2011, 1(1), 25-8. doi: 10.5923/j.Plant.20110101.04
32. Photo-irradiated biosynthesis of silver nanoparticles using edible mushroom *Pleurotus florida* and their antibacterial activity studies. Bhat R, Deshpande R, Ganachari SV, Huh DS, Venkataraman A. *Bioinorganic chemistry and application Hindawi* 2011, Article ID 650979, pp 7 doi:10.1155/2011/650979 IF: 1.165
33. Gas sensing characteristic of biofunctionalized gold nanoparticles. Ganachari SV, Deshpande R, Bhat R, Rao NVS; Huh DS, Venkataraman A. *Journal of Bionanoscience* American Scientific Publishers 2011, 5, 107-112doi:http://dx.doi.org/10.1166/jbns.2011.1052
34. Solvothermal synthesis and characterization of acicular α -Fe₂O₃ nanoparticles, Basavaraja S, Balaji DS, Bedre MD, Raghunandan D, Prithviraj Swamy PM, Venkataraman A *Bulletin of Material Science* (Indian Academy of Science (Springer) 2011, 34(7), 1-5. IF: 0.48
35. Synthesis and characterization of SnO₂ by alginate template method. Kalshetty S, Basavaraja S, Bedre MD, Deshpande R, Venkataraman A. *Journal of Metallurgy and Materials Science* 2011, 53 (2), 175-184.
36. Solvothermal synthesis and characterization of acicular α -Fe₂O₃ nanoparticles. Basavaraja S, D S Balaji DS, Bedre MD, Raghunandan D, Prithviraj Swamy PM, Venkataraman A. *Bulletin of Materials Science Indian Academy of Sciences* 2011, 34(7), 1313-1317. IF:0.584
37. Rapid biosynthesis of irregular shaped gold nanoparticles from macerated aqueous extracellular dried clove buds (*Syzygium aromaticum*) solution. Deshpande R, Bedre MD, Basavaraja S, Sawle B, Manjunath SY, Venkataraman A. *Colloids and surfaces B: Biointerfaces Elsevier* 2010, 79(1), 235-240. doi:10.1016/j.colsurfb.2010.04.003 IF: 3.554
38. Biosynthesis of stable poly shaped gold nanoparticles from microwave-exposed aqueous extracellular anti-malignant guava (*Psidium guajava*) leaf extract. Deshpande R, Basavaraja S, Mahesh B, Balaji S, Manjunath SY, Venkataraman A. *Nanobiotechnology Springer* 2009, 5(1-4), 34-41. doi: 10.1007/s12030-009-9030-8. IF: 3.52

39. Preparation and characterization of polypyrrole silver nanocomposites via interfacial polymerization. Bedre MD, Basavaraja S, Deshpande R, Balaji DS, Venkataraman A. International Journal of polymeric Materials Taylor & Francis 2010 59: 531–543. doi:10.1080/00914031003760642 IF: 1.102.
40. Preparation and characterization of magnetic Fe₃O₄ nanoparticles. Bedre MD, Deshpande R, Basavaraja S, Balaji DS, Lagashetty A, Venkataraman A. Journal of metallurgy and materials science Indian Academy of Sciences 2010, 52 (3), 209–14. IF: 0.584
41. Preparation and characterization of polyaniline–NiO nanocomposites via interfacial polymerization. Bedre MD, Basavaraja S, Deshpande R, Sawle BS, Lagashetty A, Govindraj B, Venkataraman A. J. Metallurgy and Material Science Indian Journals 2010, 52, 149– 154
42. Formulation design of rapidly disintegrating phenobarbitone tablets by direct compression method. Rampure MV, Basawaraj B, Appala Raju S, Deshpande R, Swamy PV. International Journal of Pharma and Bio Sciences 2010, 1 (4), 62–68.
43. Preparation and characterization of cobalt oxide nanoparticles via solution combustion method. Bedre MD, Basavaraja S, Deshpande R, Balaji DS, Venkataraman A. Nano Science and Nanotechnology Trade Science 2009, 3(1), p. 4.
44. Biosynthesis and stabilization of Au and Au–Ag alloy nanoparticles by fungus, *Fusarium semitectum*. Sawle BD, Salimath B, Deshpande R, Bedre MD, Prabhakar BK, Venkataraman A. Science and Technology of Advanced Materials IOP integra 2008, 9, 6pp. Doi: 10.1088/1468-6996/9/3/035012 IF: 3.52
45. Extracellular bio-stabilization of Au–Ag Bimetal nanoparticles using fungus strain *Cladosporium cladosporioides*, Balaji DS, Basavaraj S, Mahesh BD, Deshpande R, Prabhakar VK, Venkataraman A. Pharmakine 2008, 1, 12–16.

Work Highlights

1. Guava for Gold, Nature News, Nature Group, 16th Nov 2009.
doi:10.1038/nindia.2009.336

2. Microwave-assisted gold nanoparticle biosynthesis – A clean-green technology.

NanoNews European, University of Sterling, p.
[mhttp://www.nano.org.uk/news/dec2009/latest2083.htm](http://www.nano.org.uk/news/dec2009/latest2083.htm).

3. Research from College of Pharmacy yields new findings on nanoparticles, Published in Life Science Weekly, News Rx, American Leading medical newspaper, 2010.

Posters

1. Green Chemistry: Modern approaches to Pharma industry.CPPS & IPAC 2010, Chennai.

2. Poster: Biosynthesis of functionalized gold nanoparticles at human palm skin. NCRACR-2009 held at the Department of Chemistry, Osmania University, Hyderabad on 6th and 7th February, 2009.

3. Gold nanoparticle cancer cell interaction studies 2nd Bangalore Nano 2008.

4. Probable mechanisms in biosynthesis of noble metal nanoparticles by plant. UGC sponsored national Level seminar on nanoscience, technology and green chemistry. Warangal Kakatiya University, 2008. (Best poster award)

5. Oral: Synthesis of Biofunctionalized silver and gold nanoparticles by different Plants. National Level Herbo-Tech 2008 conference, Sri Krupa College, Siddipeth, Medak, AP, 2008. (Best poster award)

6. Dr. Samuel Gorge institute of pharmaceutical sc., Markapur, Prakasham Dist, AP. Pharmaquest 2009. National level symposium on the application of functionalized gold nanoparticle in preliminary stages of colon cancer. 2008 (Best Poster Award)

7. Oral: Nucleation of tiny gold nanocrystals at human palm and sole skin cells. Annual conference of Indian council of chemists to be held on 26th of December 2008 at Gurukul kangari University Haridwar, 2008.

8. Microwave induced rapid extracellular synthesis of gold and silver bioactive nanoparticles from (Psidium Guajava) guava leaves. Bangalore Nano 2007.

Totals Posters presented in Last Two Years: 36 (Details will be given on request)

Lectures Delivered

1. A Special Session on Clean-Green Nanotechnology in world congress on pharmaceutical sciences, at Goa from October 5-7th (2017).
2. International Conference and Exhibition on Cosmetology & Cosmetics, Speaker, Design an evaluation of silica coated gold shell-core nanoparticles as Anti-Aging Gel, Hyderabad Convention Center , November (2013)
3. Invited speaker A national level seminar - Emerging Trends in Nanotechnology, AB Patil Degree college, Gulbarga (2013)
4. New frontiers in Science and Advancements in Nanotechnology, presented work as a speaker at the Bharati Degree College, K. M. Doddi College, Mandya. (2012)
5. 'Nano –A green view', Speaker at Poona University sponsored state level seminar at Parikarma Pharmacy, Kasthi, Nasik, Maharashtra (2012)
6. Organizing Secretary for the National level one day work shop on 'Impact Research & Funding Opportunities' held in MRMC Medical College, Gulbarga. (Sept-2012)
7. Invited as speaker in 1st annual symposium of Antimicrobial Research (SAR- 2011) held at Beijing, China. (2011)
8. Nanobiotechnology, Prospects and future: For MSc students Karwar Arts and Sciences College, Affiliated to Dharwad University. (2010)
9. Biosynthesis of Noble Nanomaterials – Materials Science Department, special lecture to PG Diploma in Nanoscience and Technology students., Gulbarga University, Gulbarga. (2009)

Totals Lectures delivered in Last Two Years: 36 (Details will be given on request)

Extracurricular Activities

- 1. Worked in Jaycees for 8 years, President Youth Jaycee Karnataka**
- 2. Participated state level table-tennis, won the state level Pharma table-tennis and University Table- tennis tournaments.**
- 3. Won state level 'Karaji' Essay Competition**
- 4. Participated in the state level cricket coaching camps**
- 5. Passed I, II & III level Hindi Exams**
- 6. Life member of Association of Pharmaceutical Teachers of India (APTI).**
- 7. Member - CPCSEA, Animal ethical committee**