Biodata

Name Dr Meenal Kowshik

Present Position Professor, Department of Biological Sciences,
Birla Institute of Technology & Science-Pilani,
K K Birla Goa Campus.

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BITS Pilani K K Birla Goa Campus,
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Educational Qualifications:

S.No.	Degree	University	Year	Subjects	Class
1	BSc	Goa University	1995	Microbiology Chemistry	First (Subject Topper)
2	MSc	Goa University	1997	Microbiology	First (Gold Medalist)
3	Ph.D	Pune University (Work done at Agharkar Research Institute)	2003	Microbiology	-

Title of PhD thesis: Microbial synthesis of semiconductor and transition metal nanoparticles, their physico-chemical characterization and evaluation as nanomaterials. http://hdl.handle.net/10603/142611

Details of employment:

Professor in the Department of Biological Sciences at BITS Pilani, K K Birla Goa Campus, **July 2018-till date**

Associate Professor in the Department of Biological Sciences at BITS Pilani, K K Birla Goa Campus, March 2013-June 2018

Assistant Professor in the Department of Biological Sciences at BITS Pilani, K K Birla Goa Campus, **Jan 2006- Feb 2013**

Lecturer in the Department of Biological Sciences at BITS Pilani, K K Birla Goa Campus, **June 2004-Dec 2005**

Research:

Featured among the world's **top two percent scientists** to be the most cited as per the list curated by researchers from Stanford University, USA in the "single recent year data – 2021".

H Index: 26 **i10 index: 45** **Citations 4011**

Sanctioned Research Projects:

1. Development of biocompatible nanotechnology based non-viral delivery vehicle for micro dystrophin gene delivery as therapeutics for Duchenne Muscular Dystrophy ICMR proposal ID : IRIS ID 2023-19776/F2, 155 Lakhs, ICMR, Feb 2024 (**PI)**

2. Biocompatible nanoparticle mediated non viral delivery of siRNAs for lung cancer therapeutics 37WS(0136)/2023-24/EMR-II/ASPIRE, 25 Lakhs, CSIR, June 2024 (**Co-PI**)

3. Biocompatible nano-vehicle mediated delivery of siRNA into stem cells for targeting pluripotency markers as a potential therapeutic approach in regenerative medicine" (27(0362)/20/EMR-II), 33.16 lakhs, CSIR, Aug 2020-2023, (**PI**)

4. Design of "smart" scaffolds incorporating nano-bioactive molecules for treatment of type 2 diabetes mellitus associated chronic wounds" (Proposal ID: 2020-4339), 33.80 lakhs, ICMR, 09.12.2021-08.12.2024, (**PI**)

5. Mesoporous nanocomposites for controlling microbially induced corrosion caused by sulfate reducing bacteria, 32.6 lakhs, SERB, 2019-2022, (**Co-PI**)

6. Studies on biomolecular transport through nuclear pore complexes using a dual fluorescence channel confocal microscope", 44 lakhs, SERB, 2017-2020. (**Co-PI**)

7. Lanthanide doped hydroxyapatite based nano-materials for theranostics applications: Sensing, Imaging, and Therapeutics, 39.65 lakhs, DST, Nanoscience and Technology Initiative program, 18.12.2015-17.12.2018. (**PI**).

8. Synthesis of hydroxyapatite based biocompatible functional magnetic nanoparticles and investigation of its interaction with biomolecules" UGC-DAE CRS in collaboration with UGC-DAE-CSR and BARC Mumbai. 2016-2018 (**CoPI**)

9. Biological Synthesis of Metal Sulfide and Metallic Nanoparticles Using Halophilic Archaebacteria, Ministry of Earth Sciences, 17.14 Lakhs, 27.01.2011-30.12.2014. (**PI**).

10. Effect of nanoparticles on small GTPases and Protein synthesis, BRNS, 2011-2014. (**Co-I**)

11. Chemical modification of some metal ion binding peptides with photoactive molecules, and investigations on their photo-induced DNA damage and photo-enhanced antimicrobial activity, DBT, 2010-2013. (**Co-I**).

12. Studies of Haloarchaea producing polyhydroxyalkanoates, UGC, 2009-2012. (**Co-I**).

13. Studies on marine micro-organisms for synthesis of nanoparticles, DST, 8.28 24/07/2006-23/07/2009. (**PI**)

14. Preparation and characterization of nanosized TiO_2 and studies on its photodegradation capability of model organic pollutants, DST, Nanoscience and Technology Initiative program, 19.97 Lakhs; 29/01/2007-20/07/2010. (**PI**).

List of publications

1. Zantye, Pranjita, Asha Dahiya, Meenal Kowshik, Sutapa Roy Ramanan, and Indrani Talukdar. "Biocompatible hydroxyapatite-based nano vehicle bypasses viral transduction and enables sustained silencing of a pluripotency marker gene, demonstrating desired differentiation in mouse embryonic stem cells." The Journal of Gene Medicine 26, no. 7 (2024): e3716.
2. Z Reshma, **K Meenal**, Zinc biofortification and implications on growth, nutrient efficiency, and stress response in Amaranthus cruentus through soil application of biosynthesized nanoparticles, Applied Food Research, 2023, 100285
3. Kadu, Kavita, **Meenal Kowshik**, and Sutapa Roy Ramanan. "Tailoring of hydroxyapatite nanoparticle surfaces of varying morphologies to facilitate counterion diffusion and subsequent protein denaturation." Biophysical Chemistry 296 (2023): 106979.
4. Kadu, K., Hemmadi, V., Biswas, M., **Kowshik, M**., & Ramanan, S. R "Novel hydroxyapatite nanoparticle-based antibiotic alternative to combat methicillin-resistant S. aureus: A mechanism by targeting the structural and functional stability of MRSA membrane protein." Journal of Materials Research 38.6 (2023): 1609-1619.
5. Zantye P, Talukdar I, Ramanan SR, **Kowshik M***. Self-fluorescence property of octa-arginine functionalized hydroxyapatite nanoparticles aids in studying their intracellular fate in R1 ESCs. Biochemical and Biophysical Research Communications. 2022 627, 21-29
6. Zantye, Pranjita, Soniya Shende, Sutapa Roy Ramanan, Indrani Talukdar, and **Meenal Kowshik***. "Design of a Biocompatible Hydroxyapatite-Based Nanovehicle for Efficient Delivery of Small Interference Ribonucleic Acid into Mouse Embryonic Stem Cells." *Molecular Pharmaceutics* (2021). https://doi.org/10.1021/acs.molpharmaceut.0c00684
7. Reshma, Zakane, and **Kowshik Meenal***. "Foliar application of biosynthesised zinc nanoparticles as a strategy for ferti-fortification by improving yield, zinc content and zinc use efficiency in amaranth." Heliyon 8.10 (2022).
8. Kadu K, Tripathi R, **Kowshik M**, Ramanan SR. Morphological Evolution of Hydroxyapatite Nanoparticles, Synthesized via Modified Sol-Gel and Microemulsion Technique, in Response to Their Synthesis Microenvironment. Crystal Research and Technology. 2022 May 12:2200012.
9. Kadu, Kavita, **Meenal Kowshik**, and Sutapa Roy Ramanan. "Does the nanoparticle morphology influence interaction with protein: a case study with hydroxyapatite nanoparticles." *Materials Today Communications* (2021): 102172. https://doi.org/10.1016/j.mtcomm.2021.102172

10. Zalmi GA, Nadimetla DN, Kotharkar P, Puyad AL, **Kowshik M**, Bhosale SV. Aggregation-induced emission-based material for selective and sensitive recognition of cyanide anions in solution and biological assays. ACS omega. 2021 Jun 24;6(26):16704-13.
11. Fernandes F, Kotharkar P, Chakravorty A, **Kowshik M**, Talukdar I. Nanocarrier mediated siRNA delivery targeting stem cell differentiation. Current Stem Cell Research & Therapy. 2020 Feb 1;15(2):155-72. https://doi.org/10.2174/1574888x14666191202095041
12. Deshmukh, Ketaki, Sutapa Roy Ramanan, and **Meenal Kowshik***. "A novel method for genetic transformation of C. albicans using modified-hydroxyapatite nanoparticles as plasmid DNA vehicle." Nanoscale Advances (2019) DOI: 10.1039/c8na00365c
13. Ketaki Deshmukh, Sutapa Roy Ramanan, **Meenal Kowshik***, Novel one step transformation method for Escherichia coli and Staphylococcus aureus using arginine-glucose functionalized hydroxyapatite nanoparticles, Materials Science and Engineering: C, 96, 2019, 58-65, DOI: 10.1016/j.msec.2018.10.088
14. Shaik, M. Monsoor, Dapkekar, A., Rajwade, J. M., Jadhav, S. H., & **Kowshik, M*** et al. "Antioxidant-antibacterial containing bi-layer scaffolds as potential candidates for management of oxidative stress and infections in wound healing." Journal of Materials Science: Materials in Medicine 30.1 (2019): 13. DOI: 10.1007/s10856-018-6212-8
15. Kadu, Kavita, Goutam Ghosh, Lata Panicker, **Meenal Kowshik**, and Sutapa Roy Ramanan. "Role of Surface Charges on Interaction of Rod-Shaped Magnetic Hydroxyapatite Nanoparticles with Protein." Colloids and Surfaces B: Biointerfaces (2019), 177, 362-369
16. Kadu, Kavita, Meenal Kowshik, and Sutapa Roy Ramanan. "Effect of doping and surface functionalization on the conformational changes of protein upon interaction with hydroxyapatite nanoparticles." Biotechnology and Biological Sciences. CRC Press, 2019. 3-8.
17. Zantye P, Fernandes F, Ramanan SR, **Kowshik M***. Rare earth doped hydroxyapatite nanoparticles for in vitro bioimaging applications. Current Physical Chemistry. 2019 Aug 1;9(2):94-109.
18. Naik V, Zantye P, Gunjal D, Gore A, Anbhule P, **Kowshik M**, Bhosale SV, Kolekar G. Nitrogen-doped carbon dots via hydrothermal synthesis: naked eye fluorescent sensor for dopamine and used for multicolor cell imaging. ACS Applied Bio Materials. 2019 Mar 28;2(5):2069-77.
19. Achari, Gauri A., and **Meenal Kowshik***. "Recent Developments on Nanotechnology in Agriculture: Plant Mineral Nutrition, Health, and Interactions with Soil Microflora." Journal of agricultural and food chemistry 66.33 (2018): 8647-8661.

20. M. Monsoor Shaik & **Meenal Kowshik*** (2018) Ellagic acid containing collagen-chitosan scaffolds as potential antioxidative bio-materials for tissue engineering applications, International Journal of Polymeric Materials and Polymeric Biomaterials, DOI: 10.1080/00914037.2018.1443927

21. Das, Kirti Ranjan, **Meenal Kowshik**, MK Praveen Kumar, Savita Kerkar, S. K. Shyama, and Samir Mishra. "Native hypersaline sulphate reducing bacteria contributes to iron nanoparticle formation in saltpan sediment: A concern for aquaculture." *Journal of environmental management* 206 (2018): 556-564

22. Srivastava, Pallavee, and **Meenal Kowshik***. "Fluorescent Lead (IV) Sulfide Nanoparticles Synthesized by Idiomarina sp. Strain PR58-8 for Bioimaging Applications." *Applied and Environmental Microbiology* 83.7 (2017): e03091-16.

23. Naik, K. and **Kowshik, M***. (2017), The silver lining: Towards the responsible and limited usage of silver. J Appl Microbiol. doi:10.1111/jam.13525

24. Srivastava, Pallavee, and **Meenal Kowshik***. "Anti-neoplastic selenium nanoparticles from Idiomarina sp. PR58-8." *Enzyme and Microbial Technology* 95 (2016): 192-200.

25. Ketaki Deshmukh, M. Monsoor Shaik , Sutapa Roy Ramanan, **Meenal Kowshik***, "Self-Activated Fluorescent Hydroxyapatite Nanoparticles: A Promising Agent for Bioimaging and Biolabeling." *ACS Biomaterials Science & Engineering* 2.8 (2016): 1257-1264 https://doi.org/10.1021/acsbiomaterials.6b00169

26. Ketaki R. Deshmukh, Sutapa Roy Ramanan, **Meenal Kowshik*** , "Low-temperature-processed biocompatible Ag-HAp nanoparticles with anti-biofilm efficacy for tissue engineering applications." *Journal of Sol-Gel Science and Technology* 80.3 (2016): 738-747.

27. Shaik, M. Monsoor, and **Meenal Kowshik***. "Novel melt-down neutralization method for synthesis of chitosan–silver scaffolds for tissue engineering applications." Polymer Bulletin 73.3 (2016): 841-858.

28. Kshipra Naik, V Girish Chandran, Raghavan Rajashekaran, Sachin Waigaonkar and **Meenal Kowshik***, "Mechanical properties, biological behaviour and drug release capability of nano TiO2-HAp-Alginate composite scaffolds for potential application as bone implant material" Journal of Biomaterials applications, (2016) DOI: 10.1177/0885328216661219

29. Samudram A, Mangalassery BM, **Kowshik M**, Patincharath N, Varier GK, "Passive permeability and effective pore size of HeLa cell nuclear membranes." *Cell Biology International* 40.9 (2016): 991-998.

30. Prabhu, Nimali N., and **Meenal Kowshik**. "Techniques for the Isolation of Magnetotactic Bacteria." Journal of Microbial & Biochemical Technology 2016 (2016).

31. Pallavee Srivastava, Edarapalli VR Nikhil, Judith M Bragança, **Meenal Kowshik*** "Anti-bacterial TeNPs biosynthesized by haloarcheaon Halococcus salifodinae BK3" Extremophiles, (2015) DOI: 10.1007/s00792-015-0767-9

32. P Dwivedi, V Nayak, **M Kowshik***, " Role of gold nanoparticles as drug delivery vehicles for chondroitin sulfate in the treatment of osteoarthritis" Biotechnology progress, (2015) 31, 1416-1422

33. Kshipra Naik, Pallavee Srivastava, Ketaki Deshmukh, M Monsoor S, and **Meenal Kowshik***, "Nanomaterial-Based Approaches for Prevention of Biofilm-Associated Infections on Medical Devices and Implants, Journal of Nanoscience and Nanotechnology, (2015) 15, 10108–10119.

34. Naik, Kshipra, and **Meenal Kowshik***. "Anti-biofilm efficacy of low temperature processed AgCl–TiO_2 nanocomposite coating." *Materials Science and Engineering: C* 34 (2014): 62-68

35. Srivastava, Pallavee, Judith M. Braganca, and **Meenal Kowshik***. "In vivo synthesis of selenium nanoparticles by Halococcus salifodinae BK18 and their anti-proliferative properties against HeLa cell line." *Biotechnology progress* (2014) DOI: 10.1002/btpr.1992

36. Naik, Kshipra, and **Meenal Kowshik***. "Anti-quorum sensing activity of AgCl-TiO2 nanoparticles with potential use as active food packaging material." *Journal of applied microbiology* 117, no. 4 (2014): 972-983

37. Jadalannagari, Sushma, Ketaki Deshmukh, Sutapa Roy Ramanan, and **Meenal Kowshik***. "Antimicrobial activity of hemocompatible silver doped hydroxyapatite nanoparticles synthesized by modified sol–gel technique." *Applied Nanoscience*4, no. 2 (2014): 133-141

38. Arunkarthick, S., M. M. Bijeesh, Geetha K. Varier, **Meenal Kowshik***, and P. Nandakumar. "Laser scanning photothermal microscopy: fast detection and imaging of gold nanoparticles." *Journal of microscopy* (2014) DOI: 10.1111/jmi.12164

39. Srivastava, Pallavee, Judith Braganca, Sutapa Roy Ramanan, and **Meenal Kowshik***. "Green Synthesis of Silver Nanoparticles by Haloarchaeon Halococcus salifodinae BK6." In *Advanced Materials Research*, vol. 938, pp. 236-241. 2014

40. Jadalannagari, Sushma, Ketaki Deshmukh, Anita Kamra Verma, Richa Vohra **Meenal Kowshik***, and Sutapa Roy Ramanan. "Lanthanum-Doped Hydroxyapatite Nanoparticles as Biocompatible Fluorescent Probes for Cellular Internalization and Biolabeling." *Science of Advanced Materials* 6, no. 2 (2014): 312-319.

41. Naik, Kshipra, Amrita Chatterjee, Halan Prakash, and **Meenal Kowshik***. "Mesoporous TiO2 Nanoparticles Containing Ag Ion with Excellent Antimicrobial Activity at Remarkable Low Silver Concentrations." *Journal of biomedical nanotechnology* 9, no. 4 (2013): 664-673.

42. Srivastava, Pallavee, and **Meenal Kowshik***. "Mechanisms of metal resistance and homeostasis in haloarchaea." *Archaea* 2013 (2013).

43. Srivastava, Pallavee, Judith Bragança, Sutapa Roy Ramanan, and **Meenal Kowshik***. "Synthesis of silver nanoparticles using haloarchaeal isolate Halococcus salifodinae BK3." *Extremophiles* 17, no. 5 (2013): 821-831.

44. Santimano, Maria Celisa, and **Meenal Kowshik***. "Altered growth and enzyme expression profile of ZnO nanoparticles exposed non-target environmentally beneficial bacteria." *Environmental monitoring and assessment* 185, no. 9 (2013): 7205-7214..

45. Celisa Santimano, Maria, Ansie Martin, **Meenal Kowshik**, and Angshuman Sarkar. "Zinc Oxide Nanoparticles Cause Morphological Changes in Human A549 Cell Line Through Alteration in the Expression Pattern of Small GTPases at mRNA Level." *Journal of Bionanoscience* 7, no. 3 (2013): 300-306

46. Desai, Vilas, Bhanudas Naik, Narendra Nath Ghosh, and **Meenal Kowshik***. "Functionalization of AgCl/Titania Nanocomposite with Folic Acid: A Promising Strategy for Enhancement of Antimicrobial Activity." *Science of Advanced Materials* 5, no. 5 (2013): 431-439.

47. Desai, Vilas, and **Meenal Kowshik***. "Synthesis and Characterization of Fumaric Acid Functionalized AgCl/Titania Nanocomposite with Enhanced Antibacterial Activity." *Journal of nanoscience and nanotechnology* 13, no. 4 (2013): 2826-2834

48. Seshadri, Sachin, Anupama Prakash, and **Meenal Kowshik***. "Biosynthesis of silver nanoparticles by marine bacterium, Idiomarina sp. PR58-8." *Bulletin of Materials Science* 35, no. 7 (2012): 1201-1205

49. Seshadri, Sachin, K. Saranya, and **Meenal Kowshik***. "Green synthesis of lead sulfide nanoparticles by the lead resistant marine yeast, Rhodosporidium diobovatum." *Biotechnology progress* 27, no. 5 (2011): 1464-1469.

50. Jadalannagari, Sushma, Sandeep More, **Meenal Kowshik**, and Sutapa Roy Ramanan. "Low temperature synthesis of hydroxyapatite nano-rods by a modified sol–gel technique." *Materials Science and Engineering: C* 31, no. 7 (2011): 1534-1538

51. Seshadri, Sachin, and **Meenal Kowshik***. "Deoxyribonucleic Acid Functionalized with Gold Nanoparticles: A Golden Route to Molecular Biology." *Journal of Bionanoscience* 5, no. 1 (2011): 18-25.

52. Saranya, K., **Meenal Kowshik**, and Sutapa Roy Ramanan. "Synthesis of hydroxyapatite nanopowders by sol-gel emulsion technique." *Bulletin of Materials Science* 34, no. 7 (2011): 1749-1753.

53. Naik, Bhanudas, Vilas Desai, **Meenal Kowshik**, Vadakkethonippurathu Sivankutty Prasad, Gerard Franklyn Fernando, and Narendra Nath Ghosh. "Synthesis of Ag/AgCl–mesoporous silica nanocomposites using a simple aqueous solution-based

chemical method and a study of their antibacterial activity on< i> E. coli</i>." *Particuology* 9, no. 3 (2011): 243-247.

54. Bijeesh, M. M., S. Arunkarthick, Arvind Krishnan, Nishith Rastogi, Geetha K. Varier, **Meenal Kowshik**, and P. Nandakumar. "Construction of a Simple Confocal Microscope." In *Special Issue on Best Theses and Posters presented during th 19 National Laser Symposium (NLS-19)*, p. 26
55. Desai, Vilas S., and **Meenal Kowshik***. "Antimicrobial Activity of Titanium Dioxide Nanoparticles Synthesized by Sol-Gel Technique." *Research Journal of Microbiology* 4, no. 3 (2009).
56. Kakarlapudi R, Mulage P, Sharma S and **Kowshik M,** Biological synthesis of silver nanoparticles using marine bacterial culture isolated from the west coast of India, *Proceedings of International Conference on Applied Bioengineering*, Sathyabhama University, Chennai, 12-15, 2007.
57. **Kowshik, Meenal**, Shriwas Ashtaputre, Sharmin Kharrazi, W. Vogel, J. Urban, S. K. Kulkarni, and K. M. Paknikar. "Extracellular synthesis of silver nanoparticles by a silver-tolerant yeast strain MKY3." *Nanotechnology* 14, no. 1 (2003): 95.
58. **Kowshik, Meenal**, Neelima Deshmukh, W. Vogel, J. Urban, S. K. Kulkarni, and K. M. Paknikar. "Microbial synthesis of semiconductor CdS nanoparticles, their characterization, and their use in the fabrication of an ideal diode." *Biotechnology and Bioengineering* 78, no. 5 (2002): 583-588.
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60. **Kowshik M** and Paknikar K M, "Biological strategies for the production of metal-based nanocrystallites", *Physics Education* 19, (2002): 31-40.
61. Kowshik, M., and S. Nazareth. "Biosedimentation of Mine Tailings by Fusarium Solani." *, Journal Industrial Pollution Control* 17, no. 2 (2001): 341-346.
62. **Kowshik M** and Nazareth S, "Metal tolerance of *Fusarium solani", Ecology, Environment and Conservation,* 6, (2000): 391-395,
63. **Kowshik M** and Nazareth S, Biosorption of metals by *Fusarium solani, Asian J. Microbiol. Biotech. & Env. Sc*. **1** (1999): 57-61.

Patents

1. A process for manufacturing gold metal nanoparticles
   Indian Patent No. 205346

2. A process for manufacturing metal sulfide nanoparticles

Indian Patent No. 202756

3. A process for manufacturing silver metal nanoparticles
Indian Patent No. 202757

4. Nanomaterial based DNA Delivery vehicle for bacterial transformation, Provisional Indian patent application number 1529/MUM/2013
5. R-HAP Nanoparticles based Transfection Agent for Gene Therapy Provisional Indian patent Application No: TEMP/E-1/41516/2023-DEL

Book Chapters

1. Bionano-magnetic materials: synthesis and Applications in "Nanotechnology for Biomedical applications, Edited by Thomas Varghese, Atlantic Publishers.
2. Pallavee Srivastava and Meenal Kowshik (2015) **Biosynthesis of Nanoparticles from Halophiles.** In: Dinesh k Maheshwari and Meenu Saraf (Eds), Halophiles: Biodiversity and Sustainable Exploitation. Vol. 6, Springer International Publishing, Switzerland. (Book Chapter)
3. Pallavee Srivastava and Meenal Kowshik (2018) Mechanisms of bacterial heavy metal resistance and homeostasis: an overview, In *Heavy Metals in the Environment: Microorganisms and Bioremediation, Ed: Edgardo Donati, CRC Press, Taylor and Francis Group.*
4. Achari, G.A., Zakane, R.N. and Kowshik, M., 2020. Eco-friendly Nanomaterials in Agriculture: Biofortification, Plant Growth Promotion, and Phytopathogen Control. *Handbook of Nanomaterials and Nanocomposites for Energy and Environmental Applications*, pp.1-22. Ed: Oxana Vasilievna Kharissova, Leticia Myriam Torres Martínez, Boris Ildusovich Kharisov.
5. Rajwade, J. M., Kawle, K., Kulkarni, S., Kowshik, M., Rajwade, J. M., & Kowshik, M. (2023). Wound Treatment Using Nanomaterials. *Nanobiomaterials: Perspectives for Medical Applications in the Diagnosis and Treatment of Diseases*, *145*, 207-235.
6. Kowshik M, Structural DNA nanotechnology and its biomedical applications, Advances in Nano and Biochemistry, 2023.
7.

PhD. Thesis Supervised

1. Synthesis of sol-gel based titanium dioxide photocatalyst: investigations on their modification, interaction with metal ions, and antimicrobial activity, Dr. Vilas Desai, Awarded in October 2013. http://hdl.handle.net/10603/125402
2. Design and Development of Confocal Microscopic Techniques and Studies on Passive Permeability of Nuclear Membranes, Dr. Arun Karthick, Awarded in August 2015 (Co-guide).

3. Synthesis, characterization of nanostructured TiO_2 based composites and studies on their versatile biomedical applications, Dr. Kshipra Naik, Awarded in Oct 2015 http://hdl.handle.net/10603/124717
4. Biological synthesis of metallic and metal sulfide nanoparticles using halophilic archaea and bacteria, Ms. Pallavee Srivastava, thesis submitted in Nov 2016 http://hdl.handle.net/10603/182158
5. Synthesis and characterizationof fluorescent hydroxyapatite nanoparticles and their applications in bioimaging and plasmid delivery, Dr. Ketaki R Deshmukh, Awarded in April 2017 http://hdl.handle.net/10603/179249
6. Studies on fabrication of bilayer scaffolds incorporating antibacterial and antioxidant agents for wound healing applications, Mr Mohammed Mansoor Shaik, Awarded in September, 2018 http://hdl.handle.net/10603/251970
7. Hydroxyapatite nanoparticle assisted *in vitro* gene delivery in mouse embryonic stem cells: Studying mechanisms and efficiency, Ms Pranjita Zantye, Awarded in Aug, 2023.

PhD. Thesis Ongoing

1. Ms Reshma Zakane (2016PHXF0401G): Biological synthesis of Zinc oxide nanoparticles for growth promotion in locally cultivated crops in Goa.
2. Ms Kotharkar Pooja. (2017PHXF0402G): Hydroxyapatite nanoparticles assisted in vitro gene delivery in mouse myoblast stem cells for targeting genes involved in Duchenne Muscular Dystrophy,
3. Ms Fiona Fernandes(2016PH290426G): Gold nanoparticle mediated gene delivery for differentiation of stem cells into a specific lineage,
4. Ms Asha Dahiya (2020PHXF0041G) Nanocarrier-mediated gene delivery for lineage-specific differentiation of mouse embryonic stem cells,
5. Ms Athira Nair (2022PHXF0039G): Biocompatible nanoparticle mediated non-viral delivery of siRNAs for lung cancer therapeutics
6. Ms Athira Narayanan 2023PHRF0003G Studying the potential of Hydroxyapatite nanoparticles as nucleic acid-based vaccine delivery candidates, (Under BITS RMIT PhD program with Supervision by Prof. Magdalena Plebanski, and Kirsty Wilson from RMIT)
7. Ms. Pavithra p (2022PHXf0001G): Design of “bilayer” scaffolds incorporating Nano-bioactive molecules as proposed therapeutics for Type 2 diabetes mellitus-associated chronic wounds

8. Ms. Deepali Shukla (2022PHXP0037G): Non-viral biocompatible nanotechnology-based strategies for siRNA/shRNA/AON delivery towards clinical development for Facioscapulohumeral Muscular Dystrophy Therapeutics

Invited talks

- Delivered an invited Talk on “Nanobiotechnology: Prospects and Applications in Medicine” at Krishna Institute of Medical Sciences, Karad, Maharashtra on 31st Aug 2019.
- Delivered an invited talk on “Biotechnological Applications of nanoparticles” at Department of Biotechnology, Goa University, as part of Science Day celebrations on 6th March 2019.
- Invited as a resource person during the Refresher Course in Life Sciences organized by UGC-Human Resource Development Centre, Goa University from 13th November to 6th December, 2019.
- Nanotechnology- Applications in Biology and Medicine, during the plenary session at the International Seminar on "New Frontiers in Microbiology and Applied Biology" held on 7th and 8th January 2016, at Institute Menezes Braganza, Panaji, Goa.
- Prospects and applications of Nanobiotechnology: From Molecules to Systems at Advances in Microbiology and Marine Microbiology, Goa University, Feb 10, 2016
- Biosynthesis of selenium nanoparticles by haloarchaea, at the World Congress on Green Nanotechnology and its role in Sustainable Agriculture, at Sam Higginbottom Institute of Agriculture, Technology and Science, Allahabad, from March 26-27, 2015.
- Invited as a resource person for the Refresher Course in Life Science organized by UGC- Academic Staff College, Goa University, Oct 2014.
- Biocompatible silver based composites exhibiting excellent antimicrobial and anti-biofilm efficacy : Potential candidates for bone tissue engineering, at the “National Conference on Nanopharmacology, at D Y Patil Medical College, Kolhapur, from 19-20 Dec 2014
- Biocompatible silver doped hydroxyapatite and titanium dioxide nanomaterials with excellent anti-biofilm efficacy:potential candidates for bone tissue engineering, at the DST-JSPS symposium on Nanotechnology based innovation for Environmental, Energy & Biomedical Applications, at IISC, Bangalore, from December, 16-21, 2013.
- Naturally Occurring Nanoparticles, at the Monsoon International Workshop on Green Nanotechnology organized by Sam Higginbottom Institute of Agriculture, Technology & Science and University of Missouri, at Bogmallo Beach Resort Goa, from August 6-7th 2013.
- Silver Nanocomposites for Biomedical Applications, at the Select Nanomedicine 2013 Conference, at Barcelona, Spain during 11th and 12th of April 2013

- Biocompatible Silver Hydroxyapatite Nanoparticles Based Thin Film Coatings With Good Antimicrobial And Antibiofilm Activity at the 1st International Symposium on nanomedicine in drug delivery and cancer diagnosis, University of Delaware, Newark, USA. August 16-17th 2012
- Functionalization Of Silver-Titanium Dioxide Nanoparticles, A Novel Strategy For Enhancement Of Antimicrobial Activity at the Green Nanotechnology, 1st international workshop at Vishveshwaraya technological University, Belgaum, November 26-27th 2012
- Bionanomaterials: Synthesis and potential applications at UGC Sponsored National seminar on Nanomaterials and their Applications, 13 – 14 March 2012, KLE Society's Raja Lakhamangouda Science Institute, Belgaum-Karnataka
- Biological synthesis and applications of nanomaterials at UGC Sponsored National seminar on Nanomaterials: Synthesis, Characterization and Applications, 2-3 February 2012, Chowgule College of Arts and Science, Margao-Goa.
- Nanotechnology in Biomedical Applications for National Science Day celebration on 28th Feb 2012 at Dhempe College of Arts and Science, Panaji Goa.

Research Associate Supervised

Impact of Metal Oxides and Metallic Nanoparticles Towards Bacteria, Dr Maria Celisa Santimano (DBT RA; 2011-2012)

NPDF Mentor

Gauri Anil Achari, Novel sustained release biodegradable polymer coated urea and zinc nanofertilizers for synchronizing fertilizer uptake, improving productivity and prevention of bacterial wilt (BW) disease in chili (*Capsicum annum* L.), May 2017-19.

ME Thesis Supervised

Antibiofilm, cytotoxic and cytocompatible properties of silver hydroxyapatite nanoparticles coating for medical implants, Ketaki Deshmukh, May 2012.

Low temperature synthesis of hydroxyapatite,metal doped hydroxyapatite, hydroxyapatite chitin composite for biomedical applications, Sushma Jadalannagari, December 2011.

MSc Thesis Supervised

Preparation of hydroxyapatite nanopowder by sol gel emulsion technique, K Saranya, December 2008.

Professional Outreach

Nominated and served as Member, Board of Studies, Department of Biotechnology, Goa University from April 2015-June 2018.

Member Board of Studies, Biotechnology Department, Parvatibai Chowgule College of Arts and Science, since 08-Aug, 2019

Member Board of Studies, Biochemistry Department, Parvatibai Chowgule College of Arts and Science, since 24-May 2019

Member Board of Studies, Department of Microbiology, Goa University, since 08-Aug, 2019