

# Harinath Chakrapani

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## EDUCATION

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Postdoctoral Visiting Fellow, National Cancer Institute, Frederick, Maryland, USA	Sep. 2006-Jul. 2009.
Postdoctoral Research Associate, Wake Forest University, North Carolina, USA	Jan. 2006-Aug. 2006.
Ph.D., Duke University, North Carolina, USA	Aug 1999-Dec. 2005.
M.Sc., Chemistry, Indian Institute of Technology, Madras	Jul. 1997-May 1999
B.Sc., Chemistry, Loyola College, University of Madras	Jul. 1994- May 1997

## PROFESSIONAL EXPERIENCE

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Professor, Indian Institute of Science Education and Research, Pune.	May 2020 – present.
Associate Professor, Indian Institute of Science Education and Research, Pune.	Jul. 2015-May 2020.
Assistant Professor, Indian Institute of Science Education and Research, Pune.	Jul. 2009-Jul. 2015.

## PUBLICATIONS

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1. Gupta, S. M.; Mohite, P. S. **Chakrapani, H.** "Mercapto-NSAIDs Generate a Non-Steroidal Anti-Inflammatory Drug (NSAID) and Hydrogen Sulfide" *Chemical Science*, **2025**, *in press*
2. Dey Sarkar, U.; Rana, M.; **Chakrapani, H.** "Phenacylselenoesters allow facile selenium transfer and hydrogen selenide generation" *Chemical Science*, **2024**, *15*, 19315-19321
3. Manna, S.; Agrawal, R.; Yadav, T. Anand Kumar, T.; Kumari, P. Dalai, A.; Kanade, S. Balasubramanian, N. Singh, A.; **Chakrapani, H.** "Orthogonal Persulfide Generation through Precision Tools Provides Insights into Mitochondrial Sulfane Sulfur" *Angewandte Chemie International Edition* **2024**, *63*, e202411133
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6. Sawase, L.; Anand Kumar, T.; Mathew, A. B.; Khodade, V. S.; Toscano, J. P.; Saini, D. K.; **Chakrapani, H.** "β-Galactosidase-activated nitroxyl (HNO) donors provide insights into redox cross-talk in senescent cells" *Chemical Communications*, **2023**, *59*, 12751-12754.
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9. Gupta, K.; Mathew, A. B.; **Chakrapani, H.**; Saini, D. K. "H<sub>2</sub>S contributed from CSE during cellular senescence suppresses inflammation and nitrosative stress" *Biochimica et Biophysica Acta* **2023**, *1870*, 119388
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12. Bora, P.; Manna, S.; Nair, M.; Sathe, R.M.S.; Singh, S.; Adury, V.S.S.; Gupta, K.; Mukherjee, A.; Saini, D.

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## REVIEWS AND BOOK CHAPTERS

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75. Soni I.; **Chakrapani H.**; Chopra S. "Draft Genome Sequence of Methicillin-Sensitive *Staphylococcus aureus* ATCC 29213" *Genome Announcement* **2015** Sep 24;3(5).
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## PATENTS

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- Patent application 202421036480
80. **Chakrapani, H.**; Anand Kumar, T.; Singh, A. et al. 'FLUOROQUINOLONE DERIVATIVES FOR TREATMENT OF ACTIVE AND LATENT TUBERCULOSIS" Provisional Patent Application No. 202221069131
81. **Chakrapani, H.**; Kumari, P.; Chopra, S.; and others HETEROCYCLIC IODONIUM COMPOUNDS AS BROAD-SPECTRUM ANTIBACTERIAL AGENTS Patent filed 0211NF2021 (India)
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84. Toone, E. J.; **Chakrapani, H.** "Stable Neutral Nitric Oxide Source" WO2008/130567 A1, **2008**

## DOCTORAL THESES

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1. "Synthesis and Evaluation of Organic Sources of Reactive Sulfur Species" Satish R. Malwal, **2014**
2. "Synthesis and Evaluation of Small Molecule Based Reactive Oxygen Species (ROS) Generators" A. T. Dharmaraja, **2014**
3. "Synthesis and Evaluation of Bioactivatable Nitric Oxide (NO) Donors" Kavita Sharma, **2015**
4. "Synthesis and Evaluation of Small Molecule Generators of Redox-active Reactive Species" Vinayak Khodade **2016**
5. "Design, Synthesis and Evaluation of Bioactivatable Organic Donors of Sulfur Dioxide (SO<sub>2</sub>)" Kundansingh A. Pardeshi **2018**
6. "Real-Time Monitoring of Nitric Oxide Release" Govindan Ravikumar **2018**
7. "Synthesis and Evaluation of Light Triggerable Redox-Active Species Generators" Ajay Kumar Sharma, **2019**
8. "Towards Targeted and Tunable Release of Hydrogen Sulfide" Preeti Chauhan, **2019**
9. "Design, Synthesis and Evaluation of Small Molecules for Profiling Thiol Proteome of Microbes" Amogh Kulkarni **2019**
10. "Stimuli-responsive small molecule persulfidating agents" Prerona Bora **2022**
11. "Development of Iodonium-Based Gram-negative Antibacterial Compounds and Target Identification using a Chemoproteomics Approach" Pooja Kumari, **2022**
12. "Design, Synthesis and Evaluation of Bioreductively-activated Fluoroquinolone Prodrugs" T. Anand Kumar **2023**
13. "Enhancing Cellular Persulfides through Artificial Substrate of 3-mercaptopyruvate sulfurtransferase (3-MST)" Suman Manna **2023**
14. "Synthesis and Evaluation of Enzyme Activated Nitroxyl (HNO) Generators" Laxman R Sawase **2023**

## MASTERS THESES

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1. "Design, Synthesis and Evaluation of Scaffolds for Thiol-Mediated Tunable Drug Release" Rohan S. Kumbhare, **2013**
2. "Design, Synthesis and Evaluation of Nitroreductase Activated Hydrogen Sulfide Donors" Mallojala Sharath Chandra, **2015**
3. "Design, Synthesis and Evaluation of a Scaffold for Mitochondria-Targeted Drug Delivery" Bandana Kumari, **2016**
4. "Synthesis and Evaluation of Small Molecule Hydrogen Sulfide Donors" Sushma Tejasri, **2017**
5. "Green light activated BODIPY based Hydrogen sulfide donor" Aswin P. K. **2018**
6. "Oxidative Stress Triggered Tunable Hydrogen Sulfide Donors" Swetha Jos **2018**
7. "Mechanistic Investigation of Novel Unnatural Substrates for Enzymatic Production of Hydrogen sulfide in Bacteria" Mrutyunjay Nair **2019** (Supervisor; Co-Supervisor: Dr Amrita B. Hazra)
8. "Synthesis and Evaluation of Hypervalent Iodine Compounds as Antibacterial" Suraj Sharma **2019**
9. "An Esterase Activated Persulfide Donor with a Fluorescence Reporter" Amal S. Kumar **2020**
10. "Mechanistic investigation of bacterial 3-mercaptopyruvate sulfurtransferase (3MST) using unnatural substrates" Saswata Nayak **2020** (Co-Supervisor; Supervisor: Dr Amrita B. Hazra)
11. "Design and Development of Enzyme-Triggered Persulfide Donors" Manjima B.S. **2021**
12. "Design and Synthesis of Esterase Activated Nitroxyl (HNO) Donor" Jishnu C.V. **2021**.
13. Vruta Gupte (Co-Supervisor; Supervisor: Dr Amrita B. Hazra) **2022**
14. "Small Molecule Modulators of Sulfur/Selenium Transfer" Mahima Rana, **2024**
15. "Design and Synthesis of Nitroreductase activated HNO Donor" Shayandeep Bhaumik, **2024**.

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## RESEARCH FUNDING

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1. "Organic Sources of Gaseous Entities with Physiological Relevance", Department of Science & Technology (DST). Funding: Rs. 26,00,000 (**2011-2014**).
2. "Hypoxia-Activated Prodrugs of Nitric Oxide" Department of Biotechnology (DBT), Rs. 41,00,000 (**2012-2015**). Early Career Scientist, **2012**; Royal Society of Chemistry-West India
3. "Redox-Directed Mycobacterial Therapeutics" Department of Biotechnology (DBT), Rs. 56,00,000 (**2012-2015**).
4. "Small Molecule Donors of Reactive Sulfur Species" Science and Engineering Board, Department of Science & Technology (DST). Funding: Rs. 55,90,000 (**2015-2018**).
5. "Small Molecule Inducers of Redox Stress Targeting Antibiotic Resistance" Department of Biotechnology (DBT), Rs. 98,46,000; with Dr. Sidharth Chopra, CSIR-CDRI Lucknow (Co-PI). (**2016-2020**)
6. "Investigating Mycobacterial Responses to Endogenous Peroxynitrite" Department of Biotechnology (DBT), Rs. 81,04,800; with Dr. Amit Singh, IISc Bangalore (Co-PI) (**2018-present**)
7. "Design and Development of Organic Persulfide Donors" Science and Engineering Research Board, Department of Science & Technology (DST). Funding: Rs. 75,54,888 (**2019-2023**).
8. "Mechanism-Based Inhibitors of 3-Mercaptopyruvate Sulfurtransferase (3-MST)" Department of Biotechnology (DBT), Rs 17,00,000 (**2021-2024**)
9. "Targeting non-replicating drug tolerant M. tuberculosis through a pro-drug strategy" Ignite Life Sciences. Co-PI, with Amit Singh, IISc as PI
10. "Synthesis and Evaluation of Organic Modulators of Cellular Sulfane Sulfur" Science and Engineering Research Board, Department of Science & Technology (DST). Funding: Rs. 73,07,525 (**2024-present**).
11. "Comprehensive analysis of homocysteine induced neutrophil extracellular traps: Implications in pathogenesis of sepsis" as Co-PI with Manjunath B Joshi, Manipal Academy of Higher Education as PI, Centre Franco-Indien pour la Promotion de la Recherche Avancée-CEFIPRA (**2024-present**)

## RESEARCH TALKS

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1. "Current Trends in Chemical Biology" Symposium held at Ahmednagar College, Ahmednagar Maharashtra on Feb. 13, **2010**.
2. ACTREC-IISER Meet, Dec **2010** at IISER Pune
3. "RSC-West India Challenge Symposium 2012" held at Institute of Science, Nagpur on Aug 31, **2012**
4. "Advances in Synthetic and Applied Chemistry" held at Sangamner College, Sangamner Maharashtra on Sep. 7, **2012**
5. "Indian Lab Automation: Drug Discovery & Development 2012" held at Mumbai, Oct 30-31, **2012**
6. Chemical Biology Laboratory, National Cancer Institute at Frederick, USA Nov 27, **2012**
7. "International conference on Physics, Mathematics and Engineering Sciences" Pune, March 18, **2013**
8. "MDR/XDR Tuberculosis: A healthcare menace to developing countries" Sinhgad College of Pharmacy, Pune, March 22, **2013**
9. Department of Chemistry, Keele University, United Kingdom, Oct 15, **2013**
10. "The New Perspectives of Inculcating the Different Aspects of Chemistry" Department of Chemistry, University of Pune, Nov 18, 2013
11. "Kaleidoscope: a Discussion Meeting in Chemistry" International Centre, Goa, July 3-6, **2014**
12. "Recent Approaches in Drug Design" SMBT College of Pharmacy, Igatpuri, Maharashtra, Nov 20-22, **2014**
13. "New Directions in Chemical Synthesis-I" Department of Chemistry, Indian Institute of Technology Bombay, Dec 8-9, **2014**
14. "International Symposium on Bioorganic Chemistry (ISBOC-10)", IISER Pune, Jan 11-15, **2015**
15. "Emerging Trends in Chemical Sciences" Padamshri Vikhe Patil College, Pravaranagar, Jan 21, **2015**
16. Department of Chemical Sciences, Tata Institute of Fundamental Research (TIFR), Seminar July 6, **2015**
17. "Chemical Frontiers, 2015" Majorda Beach Resort, South Goa, August 15-18, 2015 (Selected for Young Scientist Award)
18. "Complex Chemical Systems" Indian Institute of Technology Kanpur, Nov 2-3, **2015**
19. "Inter-IISER Chemistry Meet" IISER Thiruvananthapuram, Dec 11-13, **2015**
20. "5<sup>th</sup> INDIGO Research Conference" Lucknow, Feb 21-24, **2016**
21. "Optics Within Life Sciences OWLS 2016" Mumbai, March 16-19, **2016**
22. "Kaleidoscope: a Discussion Meeting in Chemistry" International Centre, Goa, July 13-17, **2016**
23. "Chemsymphoria 2016" IISER Pune, July 21-22, **2016**.
24. 6th Indo Japanese International Symposium on "Overcoming Intractable Diseases Prevalent in Asian Countries" The Maquinez Palace, Goa, Sep 23-24, **2016**.

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25. National Conference on Chemistry of Light and Medicine, IIT Gandhinagar, Dec 8-9, **2016**
  26. International Conference on Organic Synthesis (ICOS 21), IIT Bombay, Mumbai Dec 11-16, **2016**
  27. National Centre for Biological Sciences (NCBS), Bangalore Life Science Cluster - iCeMS meeting, Jan 23, **2017**
  28. Chemistry Interfacing with Biology and Physics, IISER Kolkata, Jan 27-28, **2017**
  29. 1<sup>st</sup> BASF Innovation Campus Science Symposium, May 30, **2017**
  30. "Kaleidoscope: a Discussion Meeting in Chemistry" International Centre, Goa, July 5-8, **2017**
  31. 86th Conference of Society of Biological Chemists at JNU, New Delhi, Nov 16-19, **2017**
  32. Newton Bhabha Fund Antimicrobial Resistance Workshop, Bengaluru, Dec 14-18, **2017**
  33. IISER-WIS Conference on Chemical Biology, Pune, Jan 17-19, **2018**
  34. National Conference on Chemical Science: An Interdisciplinary Approach, Modern College, Pune Jan 18, **2018**
  35. "Kaleidoscope: a Discussion Meeting in Chemistry" International Centre, Goa, July 5-8, **2018**
  36. "Chemical Frontiers, 2018" Goa, August 19-22, **2018**
  37. "Indo-German Chemistry Meeting" INST Mohali, Punjab and Kasauli, Himachal Pradesh. Oct 4-7, **2018**
  38. Chemistry and Physics of Advanced Materials – III" IISER Pune-Temple University Meeting, Oct 8-9, **2018**
  39. 2<sup>nd</sup> American Gasotransmitter Symposium, University of Oregon, USA, May 18-19, **2019**
  40. "Kaleidoscope: a Discussion Meeting in Chemistry" International Centre, Goa, July 4-7, **2019**
  41. Chemical Biology and Precision Synthesis, University of Glasgow, Scotland, UK July 26-31, **2019**
  42. "Advances in Chemical Sciences and Technologies" NIT Warangal, Sep 23-25, **2019**
  43. Ecole Normale Supérieure de Lyon, France, Oct 16, **2019**
  44. Institute of Mathematical Sciences, Chennai, Oct 28, **2019**
  45. Nanyang Technological University, Singapore, Nov 11-12, **2019**
  46. Department of Chemistry, IIT Madras, Dec 27, **2019**
  47. American Chemical Society (ACS) Science Talk Series, May 29, **2020** (Webinar)
  48. Department Seminar, Birla Institute of Technology and Science (BITS) Pilani, Hyderabad Campus, Aug 14, **2020** (Webinar)
  49. "Vaishvik Bharatiya Vaigyanik" (VAIBHAV) Summit, Theme: Pharmaceuticals and Biotechnology; Sub-theme: Drug Discovery, Repurposing and Drug Delivery, Sep 19, **2020** (Webinar)
  50. Department Seminar, Birla Institute of Technology and Science (BITS) Pilani, Goa Campus, Oct 31, **2020** (Webinar)
  51. "Current Trends in Medicinal Chemistry", ASP College, Devrukh, March 24, **2021** (Webinar)
  52. "Advances in Synthetic Organic Chemistry and Their Applications in Modern Medicinal Chemistry (ASOCAMMC21)" National Institute of Technology, Calicut Aug 26, **2021** (Webinar)
  53. Chemical Research Society of India (CRSI) Meeting, Kolkata, Sep 26-30, **2021**
  54. "Kaleidoscope: a Discussion Meeting in Chemistry" Wabi-Sabi, Nashik, Oct 8-10, **2021**
  55. XXI National Organic Symposium Trust-Organic Chemistry Conference, Chennai, Nov 25-28, **2021**.
  56. Indian Institute of Technology, Patna Department Seminar, June 7, **2022**
  57. "Kaleidoscope: a Discussion Meeting in Chemistry" Udaipur, Nashik, July 28-31, **2022**
  58. Asian Chemical Biology Initiative (ACBI) Goa, September 15-18, **2022**.
  59. Royal Society of Chemistry-Contemporary Facets in Organic Synthesis, Department of Chemistry, Indian Institute of Technology, Roorkee December 1-4, **2022**
  60. InAdvanCS, Annual Symposium of the Indian Association for the Cultivation of Science, Kolkata, Jan 5-7, **2023**
  61. School of Physical and Chemical Sciences, Queen Mary University of London, UK Jan 19-20, **2023**
  62. Redox Chemical Biology of Health and Disease, April 7-8, 2023, IISER Pune
  63. Department of Chemistry, Doon University Seminar May 11, **2023**.
  64. "Kaleidoscope: a Discussion Meeting in Chemistry" Udaipur, July 6-9, **2023**
  65. FORCE IICS, Kathmandu, Nepal, September 28- October 01, **2023**.
  66. Contemporary Challenges in Chemical Science (C3S) IIT Bombay, Dec 6-8, **2023**
  67. Chemsymphoria, Department of Chemistry, IISER Pune, Dec 18-20, **2023**
  68. International Research Network on infectious diseases and antibiotic resistance (IRN MIRA), IISc Bangalore, March 5-6, **2024**
  69. Chemical Biology of Bacterial Cell Components, IIT Bombay, Powai June 25-26, **2024**.
  70. General Seminar, Department of Chemistry, IIT Kanpur, Aug 23, **2024**
  71. FORCE IICS, Alappuzha, Kerala, Oct 3-Oct 6, **2024**.
  72. Indo-German Meeting, Amritsar, Punjab, Nov 13-16, **2024**.
  73. Chem24, Indian Association for the Cultivation of Science, Kolkata, Dec 26-28, **2024**.
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## SCIENCE EDUCATION AND OUTREACH PROJECTS

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1. Training Programmes Enabling Effective Science Communication, Department of Science and Technology, **2018-2021**
2. STEP for STEM, TATA Technologies **2019-2021**
3. India Innovation Competency Enhancement Programme, Funded by a Consortium of Department of Science and Technology (DST), TATA Technologies, Royal Society of Chemistry, British Council of India, **2020-2025** (Co-Investigator, Dr Sourabh Dube, and Dr Chandrasheel Bhagwat IISER Pune)
4. Transforming Higher Education Landscape through continuous Professional Development of Teachers in Higher Education Institutes of Maharashtra, Maharashtra State Faculty Development Academy, **2021-2025** (Co-Investigator, Dr Sourabh Dube, and Dr Chandrasheel Bhagwat, IISER Pune)
5. Malaviya Mission Teacher Training Programme, Ministry of Education, **2023-present**

## POPULAR SCIENCE TALKS, OUTREACH AND TEACHING RESOURCES

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1. Kishore Vaigyanik Protsahan Yojana (KVPY) Summer Camp, **2010, 2011 & 2012**.
2. Rishi Valley School, July 4-5, **2010**
3. Royal College, Mumbai on Sep 24, **2011**
4. International Year of Chemistry Programme, Nov **2011**
5. S. P. College, Pune, Mar **2016**
6. Modern College, Pune, Oct **2016**.
7. DST-INSPIRE Camp, Pune Dec **2017**.
8. Simply Science lecture series, British Council, Pune, Aug 8, **2018**.
9. Alard College of Pharmacy, Jan **2019**
10. Science at the Sabha, Institute of Mathematical Sciences, Feb 15, **2020**
11. Tamil Nadu Science Forum, Aug 8, **2020** (webinar)
12. Delhi Public School Society, HRD Centre, June 24, **2021** (webinar)
13. INSPIRE Camp, Prabhudesai Charitable Trust, Pune Dec 9, **2021** (webinar)
14. Sagar Public School, Bhopal-Madhya Pradesh, April 26, **2022** (webinar)
15. UK-India Coming Together - Higher Education Collaboration: Strategies for Success: Industry-Academia Partnerships making it work for Employability and Research, June 8, **2022**
16. "Fostering academia-industry-society linkages through STEM research and innovation programmes" International Conference on Higher Education, Research and Innovation 2022 (ICHERI 22), July 28-30, **2022** (webinar)
17. RSC Thought-Leadership Roundtable on Tackling AMR in India, University of Bristol, UK Sep 14, **2023**
18. Royal Society of Chemistry's Select Committee on Chemical Sciences Education Strategy, Sep 9, **2024**, Bengaluru
19. Royal Society of Chemistry's Select Committee on Open Science Strategy, Sep 10, **2024**, Bengaluru
20. Early Career Researcher Workshop, IISER Pune, Oct 16, **2024**
21. Chemical Research Society of India, Mini-symposium/ Outreach Initiative, Jan 15, **2025**.
22. Royal Society of Chemistry's Roundtable on "From Lab to Market: The Journey of Scientific Entrepreneurship" Feb 4, **2025**, Mumbai

## MAJOR ADMINISTRATIVE POSITIONS

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1. Dean, International Relations and Outreach, Jan **2019-Jan 2022**.
2. Convenor, COVID-19 Task Force, May **2020-Jan 2022**.
3. Faculty-in-Charge, Science Media Centre, IISER Pune. Nov **2015-April 2019**

## NATIONAL-LEVEL COMMITTEES

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1. Member (Co-opted), Expert Committee of Start-up Research Grant, National Post-Doctoral Fellowship and Early Career Research Award Schemes, Chemical Sciences (**2021-2024**)
2. Member, Technical Expert Committee (TEC) for Vaccine Research and Development and New Drug Development, Department of Biotechnology (**2022-present**)
3. Member, Council of the Chemical Research Society of India (CRSI) (April 1, **2023**-March 31, **2026**)
4. Member, Area Review Panel, Drugs (including Drug Delivery, Biosimilar and Stem Cells (including

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Regenerative Medicines) & Vaccines and Clinical Trials, Biotechnology Industry Research Assistance Council (BIRAC) (Jun **2023-2026**)

5. Member, Domain Expert Group, CSIR Mission on Anti-microbial resistance, Feb **2024-present**

## **AWARDS AND HONOURS**

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1. Innovative Young Biotechnologist Award, **2011**; Department of Biotechnology India
2. Early Career Scientist, **2012**; Royal Society of Chemistry-West India
3. Young Scientist Award, **2015**; Chemical Research Society of India (CRSI)
4. Young Scientist Award, **2015**; Pune Municipal Corporation, Pune India.
5. Scientist Award, **2015**, Rotary Club of Pune
6. Chemical Research Society of India Bronze Medal, **2021**.
7. S Ramachandran National Bioscience Award for Career Development, **2021**, Department of Biotechnology, India
8. Editorial Board Member, Scientific Reports, Nature Publishing Group (**2017-2021**).
9. Convenor, Junior National Organic Symposium Trust (J-NOST) Meeting for Research Scholars, Oct 10-12, **2023** at IISER Pune

**Last updated: Feb 11, 2025**