

# Harinath Chakrapani

Professor, Department of Chemistry  
C307 Main Building (Office); C316 Main Building (Lab)  
Indian Institute of Science Education and Research Pune  
Dr. Homi Bhabha Road Pashan,  
Pune 411 008, Maharashtra India  
Phone: +91-20-2590-8090 (Office); +91-20-2590-8297 (Lab)  
Fax: +91-20-2589-9790  
E-mail: [harinath@iiserpune.ac.in](mailto:harinath@iiserpune.ac.in)  
URL: [www.hclab.in](http://www.hclab.in)



## EDUCATION

Postdoctoral Visiting Fellow, National Cancer Institute, Frederick, Maryland, USA  
Postdoctoral Research Associate, Wake Forest University, North Carolina, USA  
Ph.D., Duke University, North Carolina, USA  
M.Sc., Chemistry, Indian Institute of Technology, Madras  
B.Sc., Chemistry, Loyola College, University of Madras

Sep. **2006**-Jul. **2009**.  
Jan. **2006**-Aug. **2006**.  
Aug **1999**-Dec. **2005**.  
Jul. **1997**-May **1999**  
Jul. **1994**- May **1997**

## PROFESSIONAL EXPERIENCE

Professor, Indian Institute of Science Education and Research, Pune.  
Associate Professor, Indian Institute of Science Education and Research, Pune.  
Assistant Professor, Indian Institute of Science Education and Research, Pune.

May **2020** – present.  
Jul. **2015**-May **2020**.  
Jul. **2009**-Jul. **2015**.

## PUBLICATIONS

1. 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* *accepted for publication*
2. Shee, S.; Singh, S.; Tripathi, A.; Thakur, C; Kumar, T. A.; Das, M.; Yadav, V.; Kohli, S., Rajmani R.S.; Chandra, N.; **Chakrapani, H.**; Drlica, K.; Singh, A. "Moxifloxacin-Mediated Killing of Mycobacterium tuberculosis Involves Respiratory Downshift, Reductive Stress, and Accumulation of Reactive Oxygen Species" *Antimicrobial Agents and Chemotherapy* **2022**, *66*, e0059222.
3. Bora, P.; Sathian, M.B.; **Chakrapani, H.** "Enhancing Cellular Sulfane Sulfur Through  $\beta$ -glycosidase-Activated Persulfide Donors: Mechanistic Insights and Oxidative Stress Mitigation" *Chemical Communications*, **2022**, *58*, 2987–2990.
4. Bora, P.; Manna, S.; Nair, M.; Satha, R.M.S.; Singh, S.; Adury, V.S.S.; Gupta, K.; Mukherjee, A.; Saini, D. K.; Kamat, S.S.; Hazra, A. B.; **Chakrapani, H.** "Leveraging an Enzyme/ Artificial Substrate System to Enhance Cellular Persulfides and Mitigate Neuroinflammation" *Chemical Science*, **2021**, *12*, 12939-12949.
5. Khandelwal, N.; Shaikh, M.; Mhetre, A.; Balaji, K. N.; **Chakrapani, H.**; Kamat, S. S. "Fatty acid chain length drives lysophosphatidylserine-dependent immunological outputs" *Cell Chemical Biology*, **2021**, *28*, 1169-1179
6. Malwal, S. R.; Pardeshi, K. A.; Chakrapani, H. "Synthesis and evaluation of cyclic sulfite diesters as sulfur dioxide (SO<sub>2</sub>) donors" *ChemBioChem*, **2020**, *8*, 1201-1205.
7. Chauhan, P.; Gupta, K.; Ravikumar, G.; Saini, D. K.; **Chakrapani, H.** "Carbonyl Sulfide (COS) Donor Induced Protein Persulfidation Protects against Oxidative Stress" *Chemistry, an Asian Journal*, **2019**, *14*, 4717–4724 ([Selected as a VIP article; Special Issue to Celebrate the 20<sup>th</sup> Anniversary of Chemical Research Society of India](#))
8. Kulkarni, A; Soni, I.; Kelkar, D.S. Dharmaraja, A. T.; Sankar, R. K.; Beniwal, G.; Rajendran, A.; Tamhankar, S.; Chopra, S.; Kamat, S. S.; **Chakrapani, H.** "Chemoproteomics of an Indole-Based Quinone-Epoxyde identifies druggable vulnerabilities in Vancomycin resistant *Staphylococcus aureus* (VRSA)" *Journal of Medicinal Chemistry*, **2019**, *62*, 6785-6795. ([Press coverage in India Science Wire, The Hindu, IndiaBioScience, Businessline](#))
9. Sharma, A. K.; Singh, H.; **Chakrapani, H.** "Photocontrolled Endogenous Reactive Oxygen Species (ROS) Generation" *Chemical Communications*, **2019**, *55*, 5259-5262.
10. Pardeshi, K. A.; Anand Kumar. T.; Ravikumar, G; Kaul, G.; Shukla, M.; Chopra, S.; **Chakrapani, H.** "Targeted Antibacterial Activity Guided by Bacteria-Specific Nitroreductase Catalytic Activation to Produce Ciprofloxacin" *Bioconjugate Chemistry*, **2019**, *30*, 751-759.
11. Kelkar, D.; Ravikumar, G; Mehendale, N.; Singh, S.; Joshi, A.; Sharma, A. K.; Mhetre, A.; Rajendran, A.;

## Harinath Chakrapani

---

- Chakrapani, H.;** Kamat, S. S. "A chemical–genetic screen identifies ABHD12 as an oxidized-phosphatidylserine lipase" *Nature Chemical Biology*, **2019**, *15*, 169-178. ([Press coverage in Vigyan Prasar, India Science Wire, Biotech Times, The Hindu BusinessLine](#))
12. Bora, P.; Chauhan, P.; Manna, S.; **Chakrapani, H.** "A Vinyl-Boronate Ester-Based Persulfide Donor Controllable by Hydrogen Peroxide, a Reactive Oxygen Species (ROS)" *Organic Letters*, **2018**, *20*, 7916-7920.
13. Chauhan, P.; Jos, S.; **Chakrapani, H.** "Reactive Oxygen Species (ROS)-Triggered Tunable Hydrogen Sulfide (H<sub>2</sub>S) Release" *Organic Letters*, **2018**, *20*, 3766-3770. ([Selected as a part of "Letters from India, a collection featuring the work of organic chemists in India" by Editors of Organic Letters](#))
14. Kumari, P.; Kulkarni, A.; Sharma, A. K.; **Chakrapani, H.** "Visible-Light Controlled Release of a Fluoroquinolone Antibiotic for Antimicrobial Photopharmacology" *ACS Omega*, **2018**, *3*, 2155-2160.
15. Pardeshi, K. A.; Ravikumar, G.; **Chakrapani, H.** "Esterase Sensitive Self-Immolative Sulfur Dioxide (SO<sub>2</sub>) Donors" *Organic Letters*, **2018**, *20*, 4-7.
16. Ravikumar, G.; Bagheri, M.; Saini, D. K.; **Chakrapani, H.** "A small molecule for theraNOstic targeting of cancer cells" *Chemical Communications*, **2017**, *53*, 13352–13355.
17. Sharma, A. K.; Nair, M.; Chauhan, P.; Gupta, K.; Saini, D. K.; **Chakrapani, H.** "Visible-Light-Triggered Uncaging of Carbonyl Sulfide for Hydrogen Sulfide (H<sub>2</sub>S) Release" *Organic Letters* **2017**, *19*, 4822-4825.
18. Shukla, P.; Khodade, V. S.; SharathChandra, M.; Chauhan, P.; Mishra, S.; Siddaramappa, S.; Bulagonda, E. P.; Singh, A.; **Chakrapani, H.** "'On Demand" Redox Buffering by H<sub>2</sub>S Contributes to Antibiotic Resistance Revealed by a Bacteria-Specific H<sub>2</sub>S Donor" *Chemical Science* **2017**, *8*, 4967-4972. ([Press coverage in The Hindu, IndiaBioScience, Sakal Times](#))
19. Ravikumar, G.; Bagheri, M.; Saini, D. K.; **Chakrapani, H.** "FLUORO/NO, a Nitric Oxide Donor with a Fluorescence Reporter" *ChemBioChem*, **2017**, *18*, 1529–1534
20. Chauhan, P.; Bora, P.; Ravikumar, G.; Jos, S.; **Chakrapani, H.** "Esterase Activated Carbonyl Sulfide/Hydrogen Sulfide (H<sub>2</sub>S) Donors" *Organic Letters* **2017**, *19*, 62-65.
21. Khodade, V.S.; Kulkarni, A.; Sen Gupta, A.; Sengupta, K.; **Chakrapani, H.** "A Small Molecule for Controlled Generation of Peroxynitrite" *Organic Letters* **2016**, *18*, 1274-1277.
22. Pardeshi, K. A.; Malwal, S. R. Banerjee, A.; Lahiri, S.; Rangarajan, R.; **Chakrapani, H.** "Thiol Activated Prodrugs of Sulfur Dioxide (SO<sub>2</sub>) as MRSA Inhibitors" *Bioorganic and Medicinal Chemistry Letters* **2015**, *13*, 2694-2697.
23. Tyagi, P.; Dharmaraja, A. T.; Bhaskar, A.; **Chakrapani, H.;** Singh, A. "*Mycobacterium tuberculosis* has diminished capacity to counteract redox stress induced by elevated levels of endogenous superoxide" *Free Radical Biology and Medicine*, **2015**, *84*, 344-354. ([Press coverage in Pune Mirror](#))
24. Malwal, S. R.; **Chakrapani, H.** "Benzosulfones as Photochemically Activated Sulfur Dioxide (SO<sub>2</sub>) Donors" *Organic and Biomolecular Chemistry*, **2015**, *13*, 2399-2406.
25. Sankar, R. K; Kumbhare, R. S.; Dharmaraja, A. T.; **Chakrapani, H.** "A Phenacrylate Scaffold for Tunable Thiol Activation and Release" *Chemical Communications*, **2014**, *50*, 15323-15326.
26. Dharmaraja, A. T.; Jain, C.; **Chakrapani, H.** "Substituent Effects on Reactive Oxygen Species (ROS) Generation by Hydroquinones" *The Journal of Organic Chemistry*, **2014**, *79*, 9413-9417.
27. Malwal, S. R.; Labade, A.; Andhalkar, A.; Sengupta, K.; **Chakrapani, H.** "A Highly Selective Sulfinate Ester Probe for Thiol Bioimaging" *Chemical Communications*, **2014**, *50*, 11533-11535.
28. Khodade, V. S.; Sharath Chandra, M.; Banerjee, A.; Lahiri, S.; Pulipeta, M.; Rangarajan, R.; **Chakrapani, H.** "Bioreductively Activated Reactive Oxygen Species (ROS) Generators as MRSA Inhibitors" *ACS Medicinal Chemistry Letters* **2014**, *5*, 777-781.
29. Dharmaraja, A. T.; Ravikumar, G.; **Chakrapani, H.** "Arylboronate Ester Based Diazeniumdiolates (BORO/NO), a Class of Hydrogen Peroxide Inducible Nitric Oxide (NO) Donors" *Organic Letters*, **2014**, *16*, 2610-2613.
30. Dharmaraja, A. T; **Chakrapani, H.** "A Small Molecule for Controlled Generation of Reactive Oxygen Species (ROS)" *Organic Letters*, **2014**, *16*, 398-401.
31. Sharma, K.; Sengupta, K.; **Chakrapani, H.** "Nitroreductase Activated Nitric Oxide Prodrugs" *Bioorganic and Medicinal Chemistry Letters*, **2013**, *23*, 5964–5967.
32. Sharma, K.; Iyer, A.; Sengupta, K.; **Chakrapani, H.** "INDQ/NO, a Bioreductively Activated Nitric Oxide Prodrug" *Organic Letters*, **2013**, *15*, 2636–2639.
33. Malwal, S. R.; Gudem, M.; Hazra, A.; **Chakrapani, H.** "Benzosulfines as Sulfur Dioxide (SO<sub>2</sub>) Donors" *Organic Letters*, **2013**, *15*, 1116-1119.
34. Dharmaraja, A. T; Alvala, M.; Sriram, D.; Yogeewari, P.; **Chakrapani, H.** "Design, synthesis and evaluation of small molecule reactive oxygen species generators as selective *Mycobacterium tuberculosis* inhibitors" *Chemical Communications*, **2012**, *48*, 10325-10327.
35. Malwal, S. R.; Sriram, D.; Yogeewari, P.; **Chakrapani, H.** "Synthesis and antimycobacterial activity of prodrugs of sulfur dioxide (SO<sub>2</sub>)" *Bioorganic and Medicinal Chemistry Letters*, **2012**, *22*, 3603-3606.
36. Khodade, V. S.; Dharmaraja, A. T.; **Chakrapani, H.** "Synthesis, reactive oxygen species generation and copper-mediated nuclease activity profiles of 2-aryl-3-amino-1,4-naphthoquinones" *Bioorganic and Medicinal Chemistry Letters*, **2012**, *22*, 3766-3769.
37. Malwal, S. R.; Sriram, D.; Yogeewari, P.; Konkimalla, V. B.; **Chakrapani, H.** "Design, Synthesis and

## Harinath Chakrapani

- Evaluation of Thiol-Activated Sources of Sulfur Dioxide (SO<sub>2</sub>) as Antimycobacterial Agents" *Journal of Medicinal Chemistry*, **2012**, *55*, 553-557 (Highlighted in Chemical & Engineering News: <http://cen.acs.org/articles/89/web/2011/12/Hitting-TB-Toxic-Gas.html>; Press coverage: Times of India; Financial Express and Maharashtra Times)
38. Dharamaraja, A. T.; Dash, T. K.; Konkimalla, V. B.; **Chakrapani, H.** "Synthesis, Thiol-Mediated Reactive Oxygen Species Generation Profiles and Anti-Proliferative Activities of 2,3-Epoxy-1,4-Naphthoquinones" *Medicinal Chemistry Communications*, **2012**, *3*, 219-224.
  39. Holland, R.; Maciag, A. E.; Kumar, V.; Shi, L.; Saavedra, J. E.; Prud'homme, R.; **Chakrapani, H.**; Keefer, L. K. "Crosslinking Protein Glutathionylation Mediated by O<sup>2</sup>-Arylated Bis-Diazeniumdiolate "Double JS-K"" *Chemical Research in Toxicology*, **2012**, *25*, 2670-2677.
  40. Maciag, A. E.; Holland, R. J.; Saavedra, J. E.; **Chakrapani, H.**; Shami, P. J.; Keefer, L. K. "Thiol Modification By Pharmacologically Active Agents of the Diazeniumdiolate Class" *Forum on Immunopathological Diseases and Therapeutics* **2012**, *3*, 91-95.
  41. Deschamps, J. R.; Saavedra, J. E. Cao, Z.; Keefer, L. K.; **Chakrapani, H.** "Stereochemical Origins of Chromophore Extension in O<sup>2</sup>-Substituted Diazeniumdiolates, Prodrugs of Nitric Oxide" *Journal of Chemical Crystallography*, **2013**, *43*, 123-126.
  42. Maciag, A. E.; Nandurdikar, R. S.; Hong, S. Y.; **Chakrapani, H.**; Morris, N. L.; Diwan, B.; Shami, P. J.; Shiao, Y-H.; Anderson, L. M.; Keefer, L. K.; Saavedra, J. E. "Activation of the c-Jun N-terminal Kinase /Activating Transcription Factor 3 (ATF3) Pathway Characterizes Effective Arylated Diazeniumdiolate-Based Nitric Oxide-Releasing Anticancer Prodrugs" *Journal of Medicinal Chemistry* **2011**, *54*, 7751-7758.
  43. Hong, S. Y.; Borchert, G. L.; Maciag, A. E.; Nandurdikar, R. S.; Saavedra, J. E.; Keefer, L. K.; Phang, J. M.; **Chakrapani, H.** "The Nitric Oxide Prodrug V-PROLI/NO Inhibits Cellular Uptake of Proline" *ACS Medicinal Chemistry Letters*, **2010**, *1*, 386-389.
  44. Kumar, V.; Hong, S. Y.; Maciag, A. E.; Saavedra, J. E.; Adamson, D.; Prud'homme, R.; Keefer, L. K.; **Chakrapani, H.** "Stabilization of the Nitric Oxide (NO) Prodrugs and Anti-Cancer Leads, PABA/NO and Double JS-K through Incorporation into PEG-Protected Nanoparticles" *Molecular Pharmaceutics* **2010**, *7*, 291-298.
  45. Nandurdikar, R. S.; Maciag, A. E.; Hong, S. Y.; **Chakrapani, H.**; Citro, M. L.; Keefer, L. K.; Saavedra, J. E. "Glycosylated PROLI/NO Derivatives as Nitric Oxide Prodrugs" *Organic Letters*, **2010**, *12*, 56-59.
  46. Maciag, A. E.; **Chakrapani, H.**; Saavedra, J. E.; Morris, N. L.; Holland, R. J.; Kosak, K. M.; Shami, P. J.; Anderson, L. M.; Keefer, L. K. "The Nitric Oxide Prodrug JS-K is Effective Against Non-small Cell Lung Cancer Cells *in vitro* and *in vivo* : Involvement of Reactive Oxygen Species" *Journal of Pharmacology and Experimental Therapeutics* **2011**, *336*, 313-320.
  47. Rai, G.; Sayed, A. A.; Lea, W. A.; Luecke, H.; **Chakrapani, H.**; Prast-Nielsen, S.; Jadhav, A.; Leister, W.; Shen, M.; Inglese, J.; Austin, C. P.; Keefer, L. K.; Arnér, E. S. J.; Simeonov, A.; Maloney, D. J. Williams, D. L.; Thomas, C. J. "Structure-Mechanism Insights and the Role of Nitric Oxide Donation Guide the Development of Oxadiazole-2-Oxides as Therapeutic Agents against Schistosomiasis" *Journal of Medicinal Chemistry* **2009**, *52*, 6474-6483.
  48. Hong, S. Y.; Nandurdikar, R. S.; Saavedra, J. E.; Keefer, L. K.; **Chakrapani, H.** "An improved synthesis of V-PROLI/NO, a cytochrome P450-activated nitric oxide prodrug" *Tetrahedron Letters* **2009**, *50*, 4545-4548.
  49. Nandurdikar, R. S.; Maciag, A. E.; Citro, M. L.; Shami, P. J.; Keefer, L. K.; Saavedra, J. E.; **Chakrapani, H.** "Piperazine and homopiperazine analogues of JS-K, an anti-cancer lead compound" *Bioorganic and Medicinal Chemistry Letters* **2009**, *19*, 2760-2762.
  50. Hong, S. Y.; Saavedra, J. E.; Keefer, L. K.; **Chakrapani, H.** "Improved Synthesis of V-PYRRO/NO, a Liver-Selective Nitric Oxide Prodrug" *Tetrahedron Letters* **2009**, *50*, 2069-2071.
  51. **Chakrapani, H.**; Bartberger, M. D.; Toone, E. J. "C-Nitroso donors of Nitric Oxide" *The Journal of Organic Chemistry* **2009**, *74*, 1450-1453 (Featured Article).
  52. Andrei, D. A.; Maciag, A. E.; **Chakrapani, H.**; Citro, M. L.; Keefer, L. K.; Saavedra, J. E. " Aryl-bis(Diazeniumdiolates): Potent Inducers of S-Glutathionylation of Cellular Proteins and Their in Vitro Anti-proliferative Activities" *Journal of Medicinal Chemistry* **2008**, *51*, 7944-7952.
  53. **Chakrapani, H.**; Maciag, A. E.; Citro, M. L.; Keefer, L. K.; Saavedra, J. E. "Cell-permeable Esters of Diazeniumdiolate Nitric oxide Prodrugs" *Organic Letters* **2008**, *10*, 5155-5158.
  54. **Chakrapani, H.**; Kalathur, R. C.; Maciag, A. E.; Citro, M. L.; Ji, X.; Keefer, L. K.; Saavedra, J. E. "Synthesis, mechanistic studies, and anti-proliferative activity of glutathione/glutathione S-transferase activated nitric oxide prodrugs" *Bioorganic and Medicinal Chemistry* **2008**, *16*, 9764-9771.
  55. **Chakrapani, H.**; Goodblatt, M. G.; Udupi, V.; Malaviya, S.; Shami, P. J.; Keefer, L. K.; Saavedra, J. E. "Synthesis and In Vitro Anti-Leukemic Activity of Structural Analogues of JS-K, An Anti-Cancer Lead Compound" *Bioorganic and Medicinal Chemistry Letters* **2008**, *18*, 950-953.
  56. **Chakrapani, H.**; Wilde, T. C.; Citro, M. L.; Goodblatt, M. G.; Keefer, L. K.; Saavedra, J. E. "Synthesis and Studies of Structural Analogues of PABA/NO, an Anti-Cancer Lead Compound" *Bioorganic and Medicinal Chemistry* **2008**, *16*, 2657-2664.
  57. **Chakrapani, H.**; Showalter, B. M.; Citro, M. L.; Keefer, L. K.; Saavedra, J. E. "Nitric Oxide Prodrugs: Diazeniumdiolates of Hindered Secondary Amines" *Organic Letters* **2007**, *9*, 4551-4554.

# Harinath Chakrapani

58. **Chakrapani, H.**; Showalter, B. M.; Kong, L.; Keefer, L. K.; Saavedra, J. E. "V-PROLI/NO, a Prodrug of the Nitric Oxide donor, PROLI/NO" *Organic Letters* **2007**, *9*, 3409-3412.
59. **Chakrapani, H.**; Gorczynski, M. J.; King, S. B. "Allylic Nitro Compounds as Nitrite Donors" *Journal of the American Chemical Society* **2006**, *128*, 16332-16337.
60. Pamula, V. K.; Srinivasan, V.; **Chakrapani, H.**; Fair, R. B.; Toone, E. J. "A Droplet-based Lab-on-a-chip for Colorimetric Detection of Nitroaromatic Explosives" *Proceedings of the 18<sup>th</sup> IEEE International Conference on Micro Electro Mechanical Systems* **2005**, 722-725.
61. **Chakrapani, H.**; Liu, C.; Widenhoefer, R. A. "Enantioselective Cyclization/Hydrosilylation of 1,6-Enynes Catalyzed by a Cationic Rhodium Bis(phosphine) Complex" *Organic Letters* **2003**, *5*, 157-159.
62. Wang, X.; **Chakrapani, H.**; Madine, J. M.; Keyerleber, M. A.; Widenhoefer, R. A. "Cyclization/Hydrosilylation of Functionalized 1,6-Diynes Catalyzed by Cationic Platinum Complexes Containing Bidentate Nitrogen Ligands" *The Journal of Organic Chemistry* **2002**, *67*, 2778-2788.
63. Wang X.; **Chakrapani, H.**; Stengone C. N.; Widenhoefer R. A. "Synthesis of Carbobicyclic Compounds via Palladium-Catalyzed Cyclization/Hydrosilylation: Evidence for Reversible Silylpalladation" *The Journal of Organic Chemistry* **2001**, *66*, 1755-1760.

## REVIEWS AND BOOK CHAPTERS

64. Bora, P.; Chauhan, P. Pardeshi, K. A.; **Chakrapani, H.** "Small molecule generators of biologically reactive sulfur species" *RSC Advances* **2018**, *8*, 27359-27374 (Invited Review, 10<sup>th</sup> Anniversary of Chemical Frontiers, Goa).
65. Kulkarni, A.; Sharma, A. K.; **Chakrapani, H.** "Redox-Guided Small Molecule Antimycobacterials" *IUBMB Life* **2018**, *70*, 826-835 (Invited Review, Special Issue on New Advances in Tuberculosis Drug Discovery and Therapy).
66. Ravikumar, G.; **Chakrapani, H.** "Synergistic Activities of Nitric Oxide and Various Drugs" in NITRIC OXIDE DONORS, Novel Biomedical Applications and Perspectives **2017** Academic Press 293-307 (Book Chapter)
67. Soni I.; **Chakrapani H.**; Chopra S. "Draft Genome Sequence of Methicillin-Sensitive *Staphylococcus aureus* ATCC 29213" *Genome Announcement* **2015** Sep 24;3(5).
68. Sharma, K.; **Chakrapani, H.** "Site-Directed Delivery of Nitric oxide to Cancers" *Nitric Oxide: Biology and Chemistry* **2014**, *43*, 8-16 (Review).
69. Maciag, A. E.; Saavedra, J. E.; **Chakrapani, H.** "The Nitric Oxide Prodrug JS-K and its Structural Analogues as Cancer Therapeutic Agents" *Anti-Cancer Agents in Medicinal Chemistry* **2009**, *9*, 798-803. (Review)
70. Gooden, D. M.; Chakrapani, H.; Toone, E. J. "C-nitroso compounds: synthesis, physicochemical properties and biological activities"

## PATENTS

71. **Chakrapani, H.**; Malwal, S. R. "Thiol-Mediated/Activated Prodrugs of Sulfur Dioxide (SO<sub>2</sub>) Having Anti-bacterial Activity" US 9,079,870, issued July 14, **2015**; Indian Patent Application No. 3162/MUM/2012.
72. Maciag, Anna E.; Keefer, Larry K.; Saavedra, Joseph E.; Anderson, Lucy M.; **Chakrapani, H.** Diazeniumdiolated compounds, pharmaceutical compositions, and method of treating cancer. WO2011/60215 A1, **2011**
73. Toone, E. J.; **Chakrapani, H.** "Stable Neutral Nitric Oxide Source" WO2008/130567 A1, **2008**

## DOCTORAL THESES

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 Bioactivable 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 Bioactivable 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

# Harinath Chakrapani

---

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**

## MASTERS THESES

---

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" Mallojjala 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**.

## RESEARCH FUNDING

---

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 Board, Department of Science & Technology (DST). Funding: Rs. 75,54,888 (**2019-present**).
8. Mechanism-Based Inhibitors of 3-Mercaptopyruvate Sulfurtransferase (3-MST) Department of Biotechnology (DBT), Rs 17,00,000 (**2021-present**)

## RESEARCH TALKS

---

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,

# Harinath Chakrapani

---

- 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**.
  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. "Vaishwik 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. Asian Chemical Biology Initiative (ACBI) Goa, September 15-18, **2022**.

# Harinath Chakrapani

---

## SCIENCE EDUCATION AND OUTREACH PROJECTS

---

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, TATA Technologies, Royal Society of Chemistry, British Council of India, **2020-present** (Co-Investigator, Dr Sourabh Dube, 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-present** (Co-Investigator, Dr Sourabh Dube, IISER Pune)

## POPULAR SCIENCE TALKS AND TEACHING RESOURCES

---

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 (webinar)

## MAJOR ADMINISTRATIVE POSITIONS

---

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**

## HONOURS AND AWARDS

---

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. Member (Co-opted), Expert Committee of Start-up Research Grant & National Post-Doctoral Fellowship and Early Career Research Award Schemes, Chemical Sciences (**2021-present**)
  10. Member, Technical Expert Committee (TEC) for Vaccine Research and Development and New Drug Development, Department of Biotechnology (**2022-present**)
-