

HARIHARAN M

New Chemistry Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, India

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Present Address

c/o- Prof. T Govindaraju
Bioorganic Chemistry Laboratory,
New Chemistry Unit,
JNCASR, Bengaluru 64, India

Personal Information

Nationality: Indian
Gender: Male
DOB: October 05, 1996
Birth place: Puducherry

Research Interest

Chemical biology of diseases, ferroptosis and its role in various neurodegenerative disorders (AD) and cancer, liquid-liquid phase separation of proteins in health and disease, biomaterial development, therapeutic and theranostic molecular design and synthesis, RNAi therapeutics.

Academic Qualifications

2019- present: **Ph.D., Jawaharlal Nehru Centre for Advanced Scientific Research, (JNCASR)**, Bangalore, India. Research Supervisor: Prof. T Govindaraju
Thesis title: Multipronged strategies to mitigate amyloid-associated toxicities and ferroptosis in Alzheimer's disease.

2017- 2019: **M.Sc. Chemistry, Sri Sathya Sai Institute of Higher Learning, (SSSIHL)**, Puttaparthi, Andhra Pradesh, India, CGPA 8.7/10, (**Gold Medalist**).
Thesis title: Antiplasmodial and Antimalarial Activity of 3,5-Diarylidenetetrahydro-2H-pyran-4(3H)-ones *via* Inhibition of Plasmodium falciparum Pyridoxal Synthase.

2014-2017: **B.Sc. Chemistry Honors, Sri Sathya Sai Institute of Higher Learning, (SSSIHL)**, Karnataka, India. CGPA 7.6/10 (Second in section)

2014: **Central Board of Secondary Education of India, 12th Standard, Kendriya Vidyalaya No. 1, Jipmer Campus, Puducherry-** 89.4%

2012: **Central Board of Secondary Education of India, 10th Standard, Kendriya Vidyalaya No. 1, Jipmer Campus, Puducherry-** CGPA 10/10

Research Skills

- **Synthetic chemistry skill:** Synthesis of therapeutic organic molecules, peptides, polymers, hydrogels and biomaterials.
- **Spectroscopic techniques:** UV-Vis absorption, fluorescence, circular dichroism and NMR spectroscopy, biophysical studies, IR and Raman spectroscopy.
- **Molecular biology skills:** Mammalian and neuronal cell culture, cellular assays, RNA and protein isolation, PCR, RT-qPCR, immunoblotting, immunofluorescence, bacterial transformation, plasmid isolation from bacteria, DNA gel electrophoresis.
- **Animal Handling:** Wistar rat handling, intraperitoneal injection, skin and blood sample collection.
- **Techniques:** Flow cytometry, microplate reader, HPLC, LC-MS, rheological studies, MALDI and HRMS mass analysis, isothermal titration calorimetry.

- **Microscopy:** Epifluorescence and confocal microscopy, atomic force microscopy, cryo/transmission electron microscopy, field emission scanning electron microscopy.
- **Softwares:** ChemDraw, Origin, GraphPad Prism, ImageJ, Topspin and Huygens microscopy software for image deconvolution.
- **Computational skills:** Autodock vina, Autodock, PyMol, Gaussian

Research Publications

- Baruah, P.*; **Moorthy, H.***; Ramesh, M.; Padhi, D.; Govindaraju, T. A Natural Polyphenol Activates and Enhances GPX4 to Mitigate Amyloid- β Induced Ferroptosis in Alzheimer's Disease. *Chem. Sci.* **2023**, *14*, 9427–9438. (*equal first author contributions). (Recognized as one of the most popular chemical biology articles of 2023 in Chemical Science, Royal Society of Chemistry).
- **Moorthy, H.**; Ramesh, M.; Padhi, D.; Baruah, P.; Govindaraju, T. Polycatechols Inhibit Ferroptosis and Modulate Tau Liquid-Liquid Phase Separation to Mitigate Alzheimer's Disease. *Mater. Horizons* **2024**, *11*, 3082–3089.
- **Moorthy, H.**; Kamala, N.; Ramesh, M.; Govindaraju, T. Biphasic Modulation of Tau Liquid-Liquid Phase Separation by Polyphenols. *Chem. Commun.* **2024**, *60*, 4334–4337.
- **Moorthy, H.***; Datta, L. P.*; Samanta, S.; Govindaraju, T. Multifunctional Architectures of Cyclic Dipeptide Copolymers and Composites, and Modulation of Multifaceted Amyloid- β Toxicity. *ACS Appl. Mater. Interfaces* **2022**, *14*, 56535–56547. (*equal first author contributions).
- **Moorthy, H.**; Govindaraju, T. Dendrimer Architectonics to Treat Cancer and Neurodegenerative Diseases with Implications in Theranostics and Personalized Medicine. *ACS Appl. Bio Mater.* **2021**, *4*, 1115–1139.
- **Moorthy, H.**; Datta, L. P.; Govindaraju, T. Molecular Architectonics-Guided Design of Biomaterials. *Chem. – An Asian J.* **2021**, *16*, 423–442.
- Padhi, D.; Baruah, P.; Ramesh, M.; **Moorthy, H.**; Govindaraju, T. Hybrid Molecules Synergistically Mitigate Ferroptosis and Amyloid-Associated Toxicities in Alzheimer's Disease. *Redox Biol.* **2024**, *71*, 103119.
- Maity, B.; **Moorthy, H.**; Govindaraju, T. Glucose-Responsive Self-Regulated Injectable Silk Fibroin Hydrogel for Controlled Insulin Delivery. *ACS Appl. Mater. Interfaces* **2023**, *15*, 49953–49963.
- Maity, B.; **Moorthy, H.**; Govindaraju, T. Intrinsically Disordered Ku Protein-Derived Cell-Penetrating Peptides. *ACS Bio Med Chem Au* **2023**, *3*, 471–479.
- **Moorthy, H.***; Yadav, M.*; Tamang, N.; Mavileti, S. K.; Singla, L.; Choudhury, A. R.; Sahal, D.; Golakoti, N. R. Antiplasmodial and Antimalarial Activity of 3,5-Diarylidene-tetrahydro-2H-Pyran-4(3H)-Ones via Inhibition of Plasmodium Falciparum Pyridoxal Synthase. *ChemMedChem* **2023**, *18* (1), e202200411 (*equal first author contributions). (*Masters thesis work*).

Conference attended

- Presented poster at EFMC International Symposium on Chemical Biology (EFMC-ISCB 2023), jointly organized with the Swiss Chemical Society, Division for Medicinal Chemistry & Chemical Biology (DMCCB) in Basel, Switzerland.
- Presented poster in international winter school on Frontiers in Materials Science 2023, at JNCASR, Bengaluru. (**Best poster prize**).
- A 10-minute talk on New Chemistry Unit Day at JNCASR, India on October 16, 2023.

Awards and Achievements

- Received the prestigious Science and Engineering Research Board (SERB)-International Travel Scheme award for presenting a poster at EFMC International Symposium on Chemical Biology in Basel, Switzerland 2023.
- A 10-minute talk on New Chemistry Unit Day at JNCASR, India on October 16, 2023.
- Recipient of Inspire fellowship by Department of Science and Technology, India.
- Received CSIR-Junior and Senior Research Fellowship with a national rank of 58 in India in June 2019.
- Received CSIR-Junior and Senior Research Fellowship with a national rank of 60 in India in December 2019.
- Received a national GATE rank of 529 in India in 2019.
- Recipient of CBSE-CSSS scholarship for BSc (Hons.) and MSc.
- Played open state level badminton and represented Chennai region in KVS Nationals in the year 2013.
- 5 times university level singles badminton champion from 2014-19.

Referees

PhD Research Supervisor

Prof. T. Govindaraju, PhD., FRSC, FASc

Bioorganic Chemistry Laboratory

New Chemistry Unit and School of Advanced Materials (SAMat)

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