Jawaharlal Nehru Centre for Advanced Scientific Research
Bioorganic Chemistry Laboratory, New Chemistry Unit
Jakkur P.O., Bengaluru 560 064, India

JNCASR

T. Govindaraju, Ph.D., FASc, FRSC

August 19, 2024

Chair
Selection Committee
Sun Pharma Science Scholars Fellowships 2024
Sun Pharma Science Foundation

Dear Sir/Madam,

I am writing to certify that the research work submitted for the **Sun Pharma Science Scholar Fellowship 2024** has been conducted solely by **Mr. Hariharan M**. Hariharan has been a Ph.D. student under my supervision in the Bioorganic Chemistry Laboratory at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) since August 2019. His Ph.D. thesis work on the topic "*Multipronged Strategies to Mitigate Amyloid-Associated Toxicities and Ferroptosis in Alzheimer's Disease*" is a testament to his dedication, expertise, and innovative approach in the field.

In his Ph.D. work, Hariharan has developed multifunctional therapeutic molecules aimed at addressing new molecular mechanisms underlying multiple etiologies associated with AD. His research has focused on understanding and targeting *amyloid toxicity, ferroptosis, and protein phase separation*, which are *interdependent pathways driving the pathophysiology of AD*. His dedicated research in our laboratory led the discovery of a novel disease mechanism, which established ***GPX4-Ferroptosis-Alzheiemr's disease-axis*** and discovered a novel polyphenolic natural product to combat the dual toxicity to tackle Alzheimer's disease. By successfully targeting these interconnected pathways with a single multifunctional molecule, Hariharan has explored a previously untapped avenue,

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showcasing the novelty and impact of his research. The societal benefits of Hariharan's work are profound, given the increasing global burden of Alzheimer's disease. His innovative therapeutic strategies have the potential to develop effective treatments for Alzheimer's disease, thereby alleviating patient suffering and reducing the socio-economic impact of this debilitating condition.

Throughout his research, Hariharan has independently designed and executed experiments, meticulously analyzed data, and unravelled new disease mechanisms and developed novel therapeutic strategies, all of which demonstrate his high level of scientific rigor and integrity. His adherence to the highest ethical standards in research is commendable, and his exceptional scientific communication and technical skills make him an invaluable member of our research team.

Below is a list of publications pertaining to his PhD research.

- 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.

Overall, Hariharan is a highly skilled and dedicated researcher with a proven track record of excellence. The Sun Pharma Science Scholar Fellowship will serve as a pivotal milestone, further shaping and advancing his research career.

Please do not hesitate to contact me if you require any further information.

Sincerely yours,

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