



जवाहरलाल नेहरू Jawaharlal Nehru  
उन्नत वैज्ञानिक Centre For Advanced  
अनुसंधान केंद्र Scientific Research

प्रो. जी. यु. कुलकर्णी  
अध्यक्ष

Prof. G. U. Kulkarni FASc, FNASc.  
President

### Justification for sponsoring the nomination by the nominator

Prof. Govindaraju is pursuing multipronged strategies to target multiple biomarkers and disease targets to develop reliable diagnosis and therapeutics for Alzheimer's disease. He is also studying the relationship of Alzheimer's disease with cancer and diabetes.

His laboratory has established molecular tools and protocols for differential detection and diagnosis of Alzheimer's disease over other neurodegenerative diseases. To translate this invention, Govindaraju has founded a startup company (VNIR Biotechnologies Pvt. Ltd, <https://vnir.life>) to develop NIR, PET and Retina scan-based platform for early diagnosis. A novel combination-biomarker (ROS produced and proximally localized with amyloid plaques in the Alzheimer's disease brain) has been validated for reliable diagnosis of Alzheimer's disease, which is qualified to be added to designated list of biomarkers (ATN) by NIA-AA research framework 2018. His laboratory also laid the foundation for multiplexed and multimodal detection and imaging of biomarkers to generate fingerprint profiles to distinguish Alzheimer's disease from healthy individuals.

Multifunctional therapeutic candidates were developed to ameliorate multifaceted toxicity of Alzheimer's disease (TGR86, Ber-D, GHK analogue 4, synthetic chaperone-based combination lithium therapy). A novel drug candidate (TGR63) has been discovered which effectively reduce amyloid burden in the Alzheimer's disease brain and reverse cognitive decline in animal model. This candidate is taken up for clinical studies by a pharmaceutical company with promise to treat AD in humans. The interest in the inverse relationship between AD and cancer resulted in the discovery of a first small molecule-based theranostic drug candidate (TGP18) for lung cancer (validated in vivo), one of the difficult cancer types to be diagnosed and treated, and ready for translation.

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विज्ञान एवं प्रौद्योगिकी विभाग,  
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Molecular architectonics (MA), a state-of-the-art innovation and new research theme has emerged from his group to integrate the realms of molecules, nano and microscale architectures into functional applications in bioelectronics, homochirality, chirality switching, reductionistic systems to understand protein folding, high-strength biomaterials, self-cleaning, biosensors, biomimetic catalysis, , Fluorescent organic nanoclusters, drug delivery, wound-healing, stem cells to neuronal differentiation, and tissue engineering.

Overall, novel concepts and research themes in basic and applied multidisciplinary sciences have emerged from his laboratory and many of the inventions are being translated through a startup company or working with industry partners or licensed with the objective to solve problems related to human health and directly impact society.

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Place: Bengaluru

Date: 29/09/2021

प्रो. जी यू कुलकर्णी / Prof. G U KULKARNI  
अध्यक्ष / President  
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