The research work under reference has not been given any award.

Specific work for nomination:

Dr.Gopinath's research group developed nanomaterials based diagnostic kit for the rapid diagnosis of lung cancer (Indian patent granted). The proposed diagnostic kit comprises of biofunctionalized graphene quantum dots (anti-NSE/amine-N-GQDs) which act as energy donor and gold nanoparticles (AuNPs) which act as energy acceptor for the quantitative detection of neuron specific enolase (NSE); a well-known SCLC biomarker. The functionality of kit relies on the fundamental principle of energy transferring capability of donor species (anti-NSE/amine-N-GQDs) to the nearby acceptor species (AuNPs), followed by the recovery of fluorescence intensity on the addition of target antigen. The proposed fluorescent diagnostic kit successfully detected NSE biomarker with notable biosensing parameters, including wider linear detection range (0.1 pg mL^{-1} to 1000 ng mL^{-1}), the fast response time (16 min), and a remarkable low detection limit (0.09 pg mL^{-1}). Additionally, an excellent performance in spiked samples, with an average recovery of 94.69%. has also been obtained. This work was published in *ACS Applied Bio Materials*, 2020, featured in "nature INDIA". Recently, they have used Ti_3C_2-MXene decorated with nanostructured silver as a dual-energy acceptor for the fluorometric cancer biomarker detection and published in *Biosensors and Bioelectronics*, 2022, *(IF=12.6)***.** Recently, technology transfer assignment deed for three of his patent has been signed with National Research Development Corporation (NRDC), New Delhi. His contribution to Cancer research using nanotechnology is outstanding and has made an impact on the field".

Author contributions

Project investigator: Prof. P. Gopinath (Dept. of Biosciences and Bioengineering, IIT Roorkee)
Mr.Ashish Kalkal (PhD student of Dr.Gopinath)
Dr. Rangadhar Pradhan (Postdoc of Dr.Gopinath)
The remaining collaborators provided their inputs in the material characterizations.

Patent Granted

P.Gopinath, Ashish and Rangadhar Pradhan. Patent granted on 11 April 2023 for "Fluorescence based cost-effective rapid diagnostic kit for detection of small-cell lung cancer biomarker" Indian Patent Application number 202011010110.

P.Gopinath, Ashish Kalkal, Deepanshu Sharma, Ayush Tiwari and Rangadhar Pradhan. Patent granted on 28.02.2024 for MXene graphene nanohybrid thin film based electrochemical biosensors for analyte detection, its method of preparation and applications thereof" Indian Patent number 516421

All authors contributed to draft the manuscript.

(P.Gopinath)