

डॉ. सी. आनंदरामकृष्णन

FNASc, FNAAS, FRSC, FRSB, FAFST(I)

निदेशक

Dr. C. Anandharamakrishnan

FNASc, FNAAS, FRSC, FRSB, FAFST(I)

Director

Justification for Sponsoring the nomination

Dr. Kaustabh Kumar Maiti joined CSIR-NIIST in the year 2012 and quickly established an interdisciplinary research area within the interface of chemistry, biology, and nanoscience. His research focus was on the development of functionalized nano-particle probes for ultrasensitive detection of various human cancer biomarkers and other non-communicable diseases viz., Alzheimer's Disease (AD) using advanced Raman spectroscopy (surface-enhanced Raman spectroscopy: SERS) and Imaging as a diagnostic modality. His pioneering work on label-free ultrasensitive SERS technique enabled the prediction of three major grades of cervical cancer from clinically relevant exfoliated cells of the cervix. He also developed a diagnostic screening SERS kit for concomitant detection of multiple breast cancer biomarkers in breast tissue samples using antibody-conjugated SERS nanotags. The kit has immense potential to evaluate immediate treatment strategies in heterogeneous breast cancer cases. In the current ongoing activity, he is focusing on a new development of SERS-AI-based technology for early detection of multiple cancers from blood.

Moreover, Dr. Maiti showed his strong expertise in the area of nanomedicine and developed several model nano-carrier drug-delivery systems (DDS) for the targeted delivery of various combination therapies. In cancer nanomedicine, he has established multimodal theranostic nano-probes utilizing photodynamic therapy (PDT), photothermal therapy (PTT), chemotherapy as well as immunotherapy. Dr. Maiti, extended his expertise on new phytochemical entities (NPCEs) as anti-cancer Hits using a semi-synthetic modification of potent phytomolecules and evaluated by the standard *in vitro* screening techniques along with Raman Spectroscopy. Dr. Maiti has developed two SERS-based diagnostic technology for breast and cervical cancer and he has acquired several outstanding contributions in high-impact publications in international journals. He is currently well-reputed in this area, Nationally and Internationally.

Therefore, I strongly recommend Dr. Maiti for Sun Pharma Science Foundation Research Awards 2023 for his outstanding contributions to Medical Sciences especially in Basic Research for the development of cancer diagnostic nanoprobe using surface-enhanced Raman spectroscopy.



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