



Justification for Sponsoring the nomination

Dr. Kaustabh Kumar Maiti joined our institute, CSIR-NIIST in the year 2012 and quickly established a new area of research - the interface between chemistry, biology and nano science. His research focus was on the development of synthetic molecular transporter utilizing small peptide, non-peptide, macro cyclic scaffold and nano-carrier drug-delivery system (DDS) for targeted delivery of small molecular drugs, active phytochemicals, proteins, nucleic acids and DNAs.

In the area of nano-bio-science, he developed functionalized nano-particle probes for ultrasensitive detection of various human cancer biomarkers viz., cervical, breast, lung and prostate and other non-communicable disease using Raman scattering (surface enhanced Raman scattering: SERS) and Imaging as a diagnostic modality. His pioneering work on label-free ultrasensitive SERS technique to generate a differential spectral fingerprint for the prediction of three major grades of cervical cancer from clinically relevant exfoliated cells of cervix. He also developed diagnostic screening kit for concomitant detection of multiple breast cancer biomarkers in breast tissue samples using antibody conjugated SERS-nanotags. The kit can be used for real-time detection of the biomarkers, as and when the sample tissue is extracted from source. Hence, this kit has immense potential to develop immediate treatment strategies in heterogeneous breast cancer cases. These two high valued cancers diagnostic platform is well recognized in CSIR 12th FYP and CSIR Mission Mode projects in healthcare theme. Recently, he has contributed immensely as a leading team member for the development of in-house fabricated handheld Raman spectrometer which has been demonstrated for cancer screening through Raman fingerprint analysis. For this excellent achievement Dr Maiti as a team member recently received "CSIR-Technology award 2020". Moreover, Dr. Maiti showed his strong expertise on multimodal theranostic nano-probes constructions with SERS, and fluorescence, as diagnostic modalities and photodynamic therapy (PDT), photothermal therapy (PTT), chemotherapy as well as immunotherapy for treatment modalities. In the area of cancer diagnosis and therapy through SERS-nanoprobes, Dr. Maiti has several outstanding contributions in high impact journals and he is currently well reputed in this area, Nationally and Internationally.

Therefore, I strongly recommend Dr. Maiti for Sun Pharma Science Foundation Research Awards 2021 for his outstanding contributions in Medical Sciences specially in Clinical Research for the development of cancer diagnostic nanoprobes using surface enhanced Raman scattering.

Dr. A Ajayaghosh

13.9.2021



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