

Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram 695014, Kerala State, India.
An Autonomous National Institute for Discovery, Innovation & Translation
in Biotechnology and Disease Biology,
Government of India, Ministry of Science & Technology, Department of Biotechnology.

राजीव गाँधी जैव प्रौद्योगिकी केन्द्र, तिरुवनन्तपुरम 695 014, केरल, भारत.
जैवप्रौद्योगिकी और रोग जीवविज्ञान में आविष्कार, नवीनता एवं अनुवाद
की स्वायत्त राष्ट्रीय संस्थान,
भारत सरकार विज्ञान एवं प्रौद्योगिकी मंत्रालय, जैवप्रौद्योगिकी विभाग.

Citation (summary) on the outstanding research work

In the area of cancer diagnostics, Dr. Kaustabh Kumar Maiti developed functionalized nano-particle probes for ultrasensitive detection of various human cancer biomarkers viz., cervical, breast, lung, melanoma, and prostate, and recently an innovative technique for early cancer detection from blood samples using advanced Raman spectroscopy (surface-enhanced Raman spectroscopy: SERS) and Artificial Intelligence (AI) as a diagnostic modality. His pioneering work is clinically validated on antibody conjugated SERS-kit for simultaneous detection of multiple breast cancer biomarkers in a single breast tissue specimen. This kit has immense potential to evaluate immediate treatment strategies in heterogeneous breast cancer cases. He also developed a label-free ultrasensitive SERS technique which enabled the embedded artificial intelligence (EAI) algorithm for the prediction of early assessment of majorly occurring cancers including breast, lung, and larynx from clinically relevant blood plasma samples with high accuracy. Moreover, in nanomedicine, Dr. Maiti developed several nano-carrier drug-delivery systems (DDS) for the targeted delivery of various combination therapies. In cancer nanomedicine, he has established multimodal theranostic nano-probes with photodynamic therapy (PDT), photothermal therapy (PTT), chemotherapy as well as immunotherapy.

Dr. Maiti has established three patented SERS-based diagnostic technologies for breast, cervical, and early cancer prevalence using SERS-AI techniques which have evolved in CSIR Mission Mode projects, ICMR, and CSR grants in healthcare theme. He has acquired several outstanding contributions in high-impact publications in international journals and he is well-reputed in the area of cancer diagnostics, nationally and internationally.



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