इण्डियन एसोसिएशन फॉर द कल्टीवेशन ऑफ साइंस
Indian Association for the Cultivation of Science
डॉ. रंजन सेन, एफएनए, एफएएससी, एफएनएएससी
निदेशक
जे सी बोस नेशनल फेलो
Dr. Ranjan Sen, FNA, FASc, FNASc
Director
J C Bose National Fellow

Citation (summary) on the outstanding research work on which award is claimed in about 250 words signed by the nominator.

Professor Jyotirmayee Dash has made outstanding contributions in developing new tools for modulating the structure and function of non-canonical nucleic acid structures for therapeutic applications.

Targeting Nucleic Acids with Small Molecules: Professor Dash's work focuses on developing innovative methods for designing molecules that interact with DNA and RNA nucleic acid structures. Her group has designed ligands like nucleosides, heteroaromatic ligands, and PNA mimics for targeting DNA quadruplexes and potentially downregulating expression of oncogenes. She used bio-orthogonal chemistry using DNA-linked gold coated magnetic nanoparticles to develop ligands for quadruplexes, i-motifs, and HIV-1 TAR RNA under metal free alkyne and azide cycloaddition. Most intriguing is her recent work on formation of a macrocyclic compound in cells, established by immunocytochemistry. This class of macrocyclic compounds shows potential anticancer properties.

Bio-Inspired Functional Architectures: In pioneering research, her team demonstrated that a liponucleoside stabilizes DNA quadruplexes, enabling the transport of K^+ ions across cell membranes. She has utilized DNA-based templates to design antimicrobial hydrogels and synthetic ion transport systems, offering avenues for novel drug delivery and antimicrobial strategies.

Synthesis of Biologically Active Compounds: Prof. Dash's significant contributions include developing new routes to synthesize carbazole and acridone alkaloids, triazoles, and other natural products such as neo-lignan and isoampelopsin D. Their methods involve innovative catalytic processes, such as palladium-catalyzed monoacylation of carbazoles and transition metal-free synthesis of quinazolinones, hydroxymethylation of thiazoles, enabling efficient synthesis of complex organic molecules.

Prof. Dash's research encompasses nucleic acid therapeutics, innovative molecular designs, and novel synthetic pathways, all with potential applications in therapeutics and drug development.

Ranjan Sen
29/8

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