



## INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE

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### Citation (summary) on the outstanding research work

Professor **Benu Brata Das** has been honored with **The Sun Pharma Science Foundation Research Award in Medical Science (Basic Research)** for his outstanding contributions to the understanding of the molecular mechanisms underlying DNA topoisomerase I (Top1)-induced DNA damage response and its repair by Tyrosyl-DNA-phosphodiesterase (TDP1). His pioneering research has provided the first evidence linking mitochondrial dysfunction to the etiology of the neurodegenerative disease SCAN1, caused by a point mutation in human TDP1 (*Science Advance* 2019). Among Professor Das's remarkable discoveries are the identification of novel therapeutic targets such as PRMT5 and PARP1, which play crucial roles in the repair of trapped Top1-DNA lesions and act as resistance determinants in cancer chemotherapy. His team has uncovered a novel role of PARP1 in regulating Top1 nuclear mobility through Top1 PARylation. Additionally, they have demonstrated that PRMT5 is a key modulator of TDP1's DNA repair function, specifically in the resection of trapped Top1-DNA complexes (*NAR* 2016; *NAR* 2018; *Cell reports* 2022).

Recent discovery work from Professor Das's group has shown that CDK1 kinase can regulate TDP1 activity during mitosis. Cells lacking TDP1 mitotic phosphorylation exhibit significant mitotic defects, including mitotic catastrophes indicative of genomic instability (*The EMBO Journal* 2024). These discoveries hold substantial relevance for ongoing clinical trials and promise advancements in precision medicine for cancer treatment.

*A. Banerjee* 14.08.2024

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