Benu Brata Das, CV,

1. Name and full correspondence address:

Dr. Benu Brata Das, *PhD, FAScT, FNASc.*
Professor
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3. Institution:

Indian Association for The Cultivation of Science

4. Date of Birth:

24th December, 1975

5. Gender (M/F/T):

Male

6. Whether differently abled (Yes/No):

No

7. Academic Qualification (Undergraduate Onwards)

S.No	***Degree***	***Year***	***Subject***	***University/ Institute***	***Percentage (%)***
1.	BS.c	1996	Zoology (Hons), Chemistry, Botany	Burdwan University	1st Class (60%)
2.	M.Sc.	1998	Zoology	Burdwan University	1st Class (73%)
3.	Ph.D.	2006	Molecular Biology and Biochemistry	CSIR-Indian Institute of Chemical Biology/ Jadavpur University (Degree Awarded)/	NA

8. Ph.D thesis title:

Molecular Characterization of the structure of DNA Topoisomerase 1 gene of *Leishmania donovani*

Guide Name,
Dr. Hemanta K. Majumder

Institute/Organization/University,
CSIR-Indian Institute of Chemical Biology, Kolkata

Year of Award.
2006

9. Work experience:

S.No	Positions held	Name of the Institute	From	To
1.	Visiting Fellow (Post-doctoral Fellow)	National Cancer Institute, National Institute of Health, USA	22nd July 2006	22nd July 2011
2.	Full Time Federal Employee (FTE)	National Cancer Institute, National Institute of Health, USA	22nd July 2011	30th November, 2012
3.	Assistant Professor	Indian Association for the Cultivation of Science, Kolkata, India	05th December, 2012	26th Sep, 2017
4.	Associate Professor	Indian Association for the Cultivation of Science, Kolkata, India	27th September, 2017	20st April, 2021
5	Professor	Indian Association for the Cultivation of Science, Kolkata, India	21st April, 2021	Till the date

10. Professional Recognition/ Award/ Prize/ Certificate, Fellowship received by the applicant.

S.No	Name of Award	Awarding Agency	Year
1.	Elected fellow of National Academy of Science & Technology (*FNASc)*	National Academy of Science (NASI), India	2020
2.	ICMR-*Prem Nath Wah Award* (Basic/clinical Oncology)	Indian Council of Medical Research, Govt. of India	2020
3.	National Bioscience Award, DBT	Department of Biotechnology, Govt. India	2019
4.	Elected member of GRC	Guha Research Conference, India	2019
5.	Elected member FAScT	West Bengal Academy of Science and Technology	2019
6.	Selected speaker, Gordon conference	Gordon conference, USA	2018
7.	ISA-Senior Visiting Fellow-2016	University of Bologna, Italy	2016
8.	Wellcome Trust/ DBT India Alliance Intermediate Fellow	Wellcome Trust/ DBT India Alliance	2013
9.	Ramanujan Fellowship	Department of Science and Technology, Government of India	2013
10.	Ramaligaswami Fellowship	Department of Biotechnology, Government of India	2013
11.	NCI outstanding Postdoctoral Fellow award (among top five)	National Cancer Institute, NIH, USA	2012
12.	Gordon Conference Travel Award and selected speaker	Gordon Conference, USA	2012

13.	Cold Spring Harbor Meeting Travelaward and selected speaker	Cold Spring Harbor meeting, USA	2011
14.	Fellows Award for Research Excellence	NIH, USA	2011
15.	Fellows Award for Research Excellence	NIH, USA	2010
16	NDDO Honorary Award Lecture	8th International Symposium on Targeted Anticancer Therapies 2010, March 4-6. Washington DC, USA.	2010
17.	Postdoctoral visiting fellowship award	National Cancer Institute, NIH, USA	2006

Synergistic Activities:

Conference Organizer: Organized an International IABS-2018 Conference as the Coordinator on "DNA topology, chromatin structure, chromosome segregation and the dynamics of biopolymers" in IACS, Kolkata at 2015; 2018, 2023

Grant Reviewer: Served as a member of 9-grant review includes Wellcome Trust/DBT India Alliance. Medical Research Council- UK. IUSSTF, European Union grant, Irish Research Council. Also, served as grant reviewers of several Indian grants.

Outreach Activities: Delivered 52 research talks at the National and International conferences and universities/research institutes. Served as a judge for poster presentation at various conferences/meetings.

Journal Reviewer: Serves as a peer-reviewer of many scientific journals including PNAS, Nature Communications, Nature Scientific Report, Nucleic Acids Res., Cancer letters, Plos One, Genetics, FASEB J, Cancer Letter, J Med Chem, Eur J Med Chem etc.

Thesis Committee Member: Served/serving as thesis committee member of 10 Ph. D. and 5 M. S. students at IACS.

Publications (List of papers published in SCI Journals, in year wise descending order).

(*Corresponding authors, #Joint first authors; IP: Journal Impact Factor)

Key Publication of PI (Prof. Benu Brata Das)

25: Bhattacharjee S, Richardson J., ***Das, B.B**.*** FRET-based assay to estimate modulation of TDP1 activity through arginine methylation.
STAR protocol, 2023, 4, (2), 102218.

24. Chowdhuri SP, Dhiman S, Das SK, Meena N, Das S, Kumar A, ***Das, B.B**.*** Novel Pyrido[2',1':2,3]imidazo[4,5-c]quinoline Derivative Selectively Poisons Leishmania donovani Bisubunit Topoisomerase 1 to Inhibit the Antimony-Resistant Leishmania Infection *in Vivo*. ***J Med Chem***, 2023 Feb 23.

23. Bhattacharjee S, Rehman I, Basu, S., Nandy S, Richardson J., Das, B.B*. The interplay between symmetric arginine dimethylation and ubiquitylation regulates TDP1 proteostasis for the repair of topoisomerase I-DNA adducts. ***Cell Reports***, 2022,**39**, 110940 (IF: 9:43)

22. Roy Chowdhury S., Das SK., Banerjee B., Paul Chowdhuri S., Majumder H.K., and ***Das, B.B****. TDP1 knockout *Leishmania donovani* accumulate Topoisomerase1-linked DNA damage and are hypersensitive to clinically used antileishmanial drugs. ***The FASEB Journal***, 2022, 36(4): e22265. (IP: 5.19)

21. Bhattacharjee S, Rehman I, Nandy S, ***Das, B.B****. Post-translational regulation of Tyrosyl-DNA

phosphodiesterase (TDP1and TDP2) for the repair of the trapped topoisomerase-DNA covalent complex. ***DNA Repair (Amst).*** 2022 Mar; 111:103277. (IP: 4.91)

20. S Saha, KS Das, T Sharma, S Bala, A Adhikary, GZ Huang, ML Tong, Ghosh A***, Das BB,*** Rajaraman G, Mondal R. Synergistic Experimental and Theoretical Studies of Luminescent–Magnetic Ln2Zn6 Clusters. ***Inorganic Chemistry***, 2022, 61, 4, 2141–2153 (IP; 5.16)

19. *Das B.B*.*., Ghosh A., Bhattacharjee, S., Bhattachrya A**.** Trapped topoisomerase-DNA covalent complexes in the mitochondria and their role in human diseases. ***Mitochondrion,*** 2021 Sep;60:234-24. (IP: 4.16)

18. Biswas S, Das B, Alam P, Ghatak A, Ghorai A, Ghosh A, ***Das BB***, Acharya S. Supramolecular Design Strategies for Color Tuning of Iridium (III) Complexes Using a Common Framework of Cyclometalating Ligands. ***The Journal of Physical Chemistry C***, **2021**, 125 (8), 4730-4742 (IP: 4.16)

17. Chowdhuri, S. P., and ***Das, B.B***.* **2021** Top1-PARP1 association and beyond: from DNA topology to break repair**.** ***NAR Cancer,*** **3(1): zcab003.**

16. De A, Bala S, Saha S, Das KS, Akhtar S, Adhikary A, Ghosh A, Huang GZ, Chowdhuri SP, ***Das BB,*** Tong ML, Mondal R. Lanthanide clusters of phenanthroline containing a pyridine-pyrazole based ligand: magnetism and cell imaging. ***Dalton Trans.*** 2021, 10:3593-3609. (IP: 4.39)

15. Saha S, De A, Ghosh A, Ghosh A, Bera K, Das KS, Akhtar S, Maiti NC, Das AK, ***Das BB***, Mondal R. Pyridine-pyrazole based Al(iii) 'turn on' sensor for MCF7 cancer cell imaging and detection of picric acid. ***RSC Adv.*** **2021**. 11(17):10094-10109. (IP: 3.36)

14.Kundu, B., Sarkar, D., *Chowdhuri, S. P*., Pal, S., *Ghosh, A.*, *Das, S. K.*, Mukherjee, A., Bhattacharya, D., ***Das, B.B***.* Talukdar, A.* **2020**. Development of a metabolically stable topoisomerase I poison as anticancer agent. ***Eur J Med Chem.; 202:112551.*** (IP: 5.57).

13. Bej R, Ghosh A, Sarkar J, ***Das, B.B***., Ghosh S. ***2020***, Thiol-Disulfide Exchange Reaction Promoted Highly EfficientCellular Uptake of Pyridyl Disulfide Appended Nonionic Polymers. ***Chembiochem,*** *21(20):2921-2926.* (IP: 2.8)

12.Gain, C., Malik, S., Bhattacharjee, S., Ghosh, A., Robertson, ES., ***Das, B.B***., Saha, A. **2020.** Proteasomal inhibition triggers viral oncoprotein degradation via autophagy-lysosomal pathway**.** ***PLoS Pathog*.** Feb 24;16(2):e1008105. (IP: 6.15)

11.Ghosh, A., Bhattacharjee, S., Paul Chowdhuri, S., Mallick, A, Rehman, I., Basu, S., and ***Das, B.B**.** 2019. SCAN1- TDP1 trapping on mitochondrial DNA promotes mitochondrial dysfunction and mitophagy. ***SCIENCE ADVANCES***, ***2019***, ***5, eaax9778***. (IP: 14.14)

10. Halder, D., Saha, S., Singh, R., Ghosh, I., Mallick, D., Dey, S., *Ghosh. A.*, ***Das, B.B.,*** Ghosh S and Jana SS. **2019.** Non- muscle myosin IIA and IIB differentially modulate migration and alter gene expression in primary mouse tumorigenic cells,***Mol Biol Cell.*** 30 (12): 1463-1476. (IP: 3.90)

9. Rehman, I.; Basu, S.; Das, S.K.; Bhattacharjee, S.; Ghosh, A.; Pommier, Y.; and ***Das, B.B****. **2018.** PRMT5-mediated arginine methylation of TDP1 for the repair of topoisomerase I covalent complexes. ***Nucleic. Acids***

Research., **46**: 5601- 5617. (IP: 16.97)

8. Kundu, B., *Das, S. K.*, *Chowdhuri, S. P*., Pal, S., Sarkar, D., *Ghosh, A.*, Mukherjee, A., Bhattacharya, D., ***Das, B.B***.* Talukdar, A. **2019**. Discovery and Mechanistic Study of Tailor-Made Quinoline Derivatives as Topoisomerase 1 Poison with Potent Anticancer Activity. ***Journal of Medicinal Chemistry (ACS)***., **62**: 3428-3446. (IP: 6.56)

7. Mallick, A., Kuman, M.M., *Ghosh A*, ***Das, B.B.,*** and Basu, S. **2018**. Cerberus Nanoparticles: Co targeting of Mitochondrial DNA and Mitochondrial Topoisomerase I in Breast Cancer Cells. ***ACS Applied Nano Materials***, 1 (5), 2195-2205.

6. S Bhowal*, A Ghosh, SP Chowdhuri, R Mondal*, ***BB Das #*****. 2018.** A Novel Metallogel Based Approach to Synthesize (Mn, Cu) Doped ZnS Quantum Dots and Labeling of MCF-7 Cancer Cells. ***Dalton Transactions,*** **47**, 6557. (IP: 4.09)

5. Das SK, Ghosh A, Paul Chowdhuri S, Halder N, Rehman I, Sengupta S, Sahoo KC, Rath H*, ***Das BB*** #*. **2018** Neutral Porphyrin Derivative Exerts Anticancer Activity by Targeting Cellular Topoisomerase I (Top1) and Promotes Apoptotic Cell Death without Stabilizing Top1-DNA Cleavage Complexes. ***J. Med. Chem***., 61 (3), 804–817. (IP: 6.56)

4. Maji S, Alam P, Kumar GS, Biswas S, Sarkar PK, Das B, Rehman I, ***Das BB*** #, Jana NR, Laskar IR, Acharya S. **2017** Induced Aggregation of AIE-Active Mono-Cyclometalated Ir(III) Complex into Supramolecular Branched Wires for Light- Emitting Diodes. ***Small.*** 13, 1603780. 2017. (IP: 10.58)

3. Das, S.K., Rehman, I., Ghosh, A., Sengupta, S., Majumder, P., Jana, B and ***Das BB****#***.** Poly(ADP-ribose) polymers regulate DNA topoisomerase I (Top1) nuclear dynamics and camptothecin sensitivity in living cells. ***Nucleic. Acids Res.*** 44, 8363-75. 2016. (IP: 16.97)

2. Majumdar, P, Bathula C, *Basu S.M., Das, S.K.,* Agarwal R, Hati S, Singh A, Sen, S*, ***Das, B.B.****. 2015. Design, synthesis and evaluation of thiohydantoin derivatives as potent topoisomerase I (Top1) inhibitors with anticancer activity. ***Eur J Med Chem.;***102:540-5. (IP: 4.81; Ci: 29)

1. Das, B.B*, Huang S.N., Murai J., *Rehman I*[@]., Amé J.-C., *Sengupta S*[@]., *Das S.K.*[@].,*Majumdar, P*[@]., Zhang H., Biard D., Majumder H.K., Schreiber V., Pommier Y.*, 2014. PARP1-TDP1 coupling for the repair of topoisomerase I-induced DNA damage, ***Nucleic. Acids Res***., 42:4435-49. 2014. (IP: 10.25; Ci: 121)

Publication Prior to Joining IACS

28. Pommier Y, Huang SY, Gao R, **Das BB**, Murai J, Marchand C. Tyrosyl-DNA-phosphodiesterases (TDP1 and TDP2). ***DNA Repair***; **19**:114-29. 2014

27. Das BB*, Huang S.N., Murai J., Rehman I., Amé J.-C., Sengupta S., Das S.K., Majumdar P., Zhang H., Biard D., Majumder H.K., Schreiber V., Pommier Y.*, PARP1-TDP1 coupling for the repair of topoisomerase I-induced DNA damage, ***Nucleic. Acids Res***., 42:4435-49. 2014.

27. Rui G¶., **Das BB¶**., Chatterjee R., Vinson C and Pommier Y., Epigenetic and genetic inactivation of tyrosyl- DNA- phosphodiesterase 1 (TDP1) in human lung cancer cells. ***DNA Repair***, 13:1-9. 2014 ¶ Joint first author.

26. Murai J., Huang SY., **Das BB,** Renaud A., Zhang Y., Doroshow JH., Ji J.,Takeda S and Pommier Y. Trapping of PARP1and PARP2 by Clinical PARP Inhibitors. ***Cancer Research***, 72: 5588-99. 2012

25. Murai J., Huang SY., **Das BB,** Dexheimer TS., Takeda S and Pommier Y. Tyrosyl-DNA phosphodiesterase 1 (TDP1) repairs DNA damages induced by topoisomerases I and II, and base alkylation in vertebrate cells. ***J. Biol. Chem***, 287(16):12848-57. (2012)

24. Douarre C., Sourbier C., Dalla Rosa I., **Das BB.,** Redon CE., Zhang H., Neckers L and Pommier Y. Mitochondrial Topoisomerase I is Critical for Mitochondrial Integrity and Cellular Energy Metabolism. ***PLoS One***.;7(7):e41094. 2012.

23. Das, BB, Dexheimer TS, Maddali K and Pommier Y. Role of Tyrosyl DNA Phosphodiesterase (TDP1) in mitochondria. ***Proc Natl Acad Sci U S A***. 16;107(46):19790-19795. 2010.

22. Das, BB, Antony S, Gupta, S, Dexheimer TS, Redon CE, Garfield S, Shiloh Y and Pommier Y. Optimal function of theDNA repair enzyme TDP1 requires its phosphorylation by ATM and/or DNA-PK. ***EMBO J.*** **28**, 3667-3680. 2009.

21. Sordet, O., Redon, C, Guirouilh-Barbat J., Smith S, Solier, S, Douarre, C, Conti, C, Nakamura, A, **Das, BB**, Nicolas E, Kohn, KW, Bonner, WM, Pommier, Y. Ataxia telangiectasia mutated activation by transcription- and topoisomerase I- induced DNA double-strand breaks. *EMBO Rep* . **10**(8):887-93. 2009.

20. Das BB, Ganguly A, Majumder HK. DNA topoisomerases of Leishmania: the potential targets for anti-leishmanial therapy. Adv Exp Med Biol.; ***625***:103-15. Review. 2008.

19. Roy A, Ganguly A, BoseDasgupta S, **Das BB**, Pal C, Jaisankar P, Majumder HK. Mitochondria-dependentreactive oxygen species-mediated programmed cell death induced by 3,3'-diindolylmethane through inhibition of F0F1- ATP synthase in unicellular protozoan parasite Leishmania donovani. *Mol Pharmacol*. , **74**, 1292-307. 2008.

18. BoseDasgupta S, **Das BB**, Sengupta S, Ganguly A, Roy A, Dey S, Tripathi G, Dinda B, Majumder HK. The caspase- independent algorithm of programmed cell death in Leishmania induced by baicalein: the role of LdEndoG, LdFEN-1 and LdTatD as a DNA 'degradesome'. *Cell Death Differ*, **10**, 1629-40. 2008.

17. Bosedasgupta S., **Das BB**. Ganguly A., Roy A., Majumder HK. Amino acids 39-456 of the large subunit and 210-262 of the small subunit constitute the minimal functionally interacting fragments of the unusual heterodimeric topoisomerase IB of Leishmania. *Biochem J*. **15**; 481-9. 2008.

16. Bosedasgupta S., Ganguly A., **Das BB**., Roy A., Majumder HK. The large subunit of Leishmania topoisomerase Ifunctions as the 'molecular steer' in type IB topoisomerase. *Molecular Microbiology*. 67, 31-46. 2008.

15. Roy A., **Das BB**., Ganguly A., Bosedasgupta S., Khalko NV., Pal C., Dey S., Giri VS. and Majumder HK. An insight into the mechanism of inhibition of unusual bi-subunit topoisomerase I from Leishmania donovani by 3,3'- di- indolylmethane, a novel DNA topoisomerase I poison with a strong binding affinity to the enzyme. *Biochem J*. **409**, 611- 22. 2008.

14. Ganguly A., **Das BB**., Roy A., Sen N., Dasgupta SB., Mukhopadyay S., Majumder HK., Betulinic acid, a catalytic inhibitor of topoisomerase I, inhibits reactive oxygen species-mediated apoptotic topoisomerase I-DNA cleavable complex formation in prostate cancer cells but does not affect the process

of cell death. *Cancer Res*. **24**: 11848-58. 2007.

13. Das BB., Bosedasgupta S., Ganguly A., Majumder S., Roy A and Majumder HK Leishmania donovani bisubunit topoisomerase I gene fusion leads to an active enzyme with conserved type IB enzyme function. *FEBS J*. **274**:150- 63. 2007.

12. Sen N., Banerjee B., **Das BB**., Ganguly A., Sen T., Pramanik S., Mukhopadhay S and Majumder HK Apoptosis is induced in leishmanial cells by a novel protein kinase inhibitor withaferin A and is facilitated by apoptotic topoisomerase I-DNA complex. *Cell Death Differ*. **2**. 358-67. 2007.

11. **Das BB**., Sengupta T., Ganguly A. and Majumder HK., Topoisomerases of kinetoplastid parasites: why so fascinating? *Molecular Microbiology*. **62**, 917-27. 2006.

10. Sen N, Banerjee B, Gupta SS, **Das BB**, Ganguly A, Majumder HK. Leishmania donovani: dyskinetoplastid cells survive and proliferate in the presence of pyruvate and uridine but do not undergo apoptosis after treatment with camptothecin. *Exp Parasitol*. **115**. 215-9. 2007.

9. Ganguly A**., Das BB**., Sen N., Roy A., Dasgupta SB and Majumder HK. LeishMan' topoisomerase I: an ideal chimerafor unraveling the role of the small subunit of unusual bi-subunit topoisomerase I from Leishmania donovani. *Nucleic Acids Res*. **34**, 6286-97. 2006.

8. Das BB, Sen N, Dasgupta SB, Ganguly A, Majumder HK. Differential induction of Leishmania donovani bi- subunit topoisomerase I-DNA cleavage complex by selected flavones and camptothecin: activity of flavones against camptothecin-resistant topoisomerase I. *Nucleic Acids Res*. **34**, 1121-32. 2006.

7. Sen N, **Das BB**, Ganguly A, Banerjee B, Sen T and Majumder HK. Leishmania donovani: intracellular ATP level regulates apoptosis-like death in luteolin induced dyskinetoplastid cells. *Exp Parasitol*. 114(3):204-14. 2006.

6. Das BB, Ganguly A, Majumder HK. Topoisomerase research of kinetoplasti parasite Leishmania, with special referenceto development of therapeutics. *Indian J Med Res*. 123(3):221-32. Review. 2006.

5. Gosh S, Bandyopadhyay S, Pal S, **Das BB**, Bhattacharya DK, Mandal C. Increased interferon gamma production byperipheral blood mononuclear cells in response to stimulation of overexpressed disease-specific 9-O- acetylatedsialoglycoconjugates in children suffering from acute lymphoblastic leukaemia. *Br J Haematol*. 128, 35- 41. 2005.

4. Das BB ., Sen N, Dasgupta SB, Ganguly A, Majumder HK. N-terminal region of the large subunit of *Leishmania donovani* bi-subunit topoisomerase I is involved in DNA relaxation and interaction with smaller subunit. *J Biol Chem*. 280, 16335-44. 2005.

3. Sen N, **Das BB**, Ganguly A, Mukherjee T, Bandyopadhyay S, Majumder HK. Camptothecin-induced imbalance in intracellular cation homeostasis regulates programmed cell death in unicellular hemoflagellate *Leishmania donovani*. *J Biol Chem*. **279**, 52366-75. 2004.

2. Sen N, **Das BB**, Ganguly A, Mukherjee T, Tripathi G, Bandyopadhyay S, Rakshit S, Sen T, Majumder HK. Camptothecin induced mitochondrial dysfunction leading to programmed cell death in unicellular hemoflagellate *Leishmania donovani*. *Cell Death Differ*. **8**, 924-36. 2004.

1. Das BB., Sen N, Ganguly A, Majumder HK. Reconstitution and functional characterization of the unusual bi-subunit type I DNA topoisomerase from *Leishmania donovani*. *FEBS Lett*. **565**, 81-8. 2004.

Detail of patents.

US Patent: Bicycle topoisomerase i inhibiting compounds, process for preparation and use thereof Application number# 17059289 Date: 2021/8/12,

Reports/Chapters/General articles etc.

1. Leishmania, the causative agent of Kala Azar: DNA transaction enzymes as possible drug targets. Recent Advances in Communicable and Non-communicable Diseases. Sengupta S, ***Das BB*** and Majumder HK. (ISBN 978-93-81891-31-5), Book: Asis Datta and V.P. Sharma Eds., The National Academy of Sciences, India, Publisher: Capital Publishing Company, New Delhi pp. 227-243. **2016**

2. Tyrosyl-DNA phosphodiesterase 1. Dexhimer TS., Huang Shar-yin, ***Das BB*** and Pommier Y**.** Book: DNA Topoisomerases and Cancer: Publisher: Springer, NY USA. **2011**

3. DNA topoisomerases of Leishmania: the potential targets for anti-leishmanial therapy. ***Das BB,*** Ganguly A, Majumder HK. Book: Drug Targets in Kinetoplastid Parasites; Publisher: Springer, NY USA. **2008**.

***Patents:* Indian Patent filed on dated 29.05.2018 with application No. 201811020003. Title: Bicyclic compounds as topoisomerase I inhibitors**
US Patent Number: US20210246128A1; Publication Date: 2021-08-12; Filing Date: 2019-05-24; Title BICYCLE TOPOISOMERASE I INHIBITING COMPOUNDS, PROCESS FOR PREPARATION AND USE THEREOF

Invited Talks: 52 (International and National); WoS Researcher ID - AAC-3452-2022; Scopus Author ID - 7403286038;
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