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A. Current position: Assistant Professor, Biological Science, Bose Institute

B. Research Interest

Dr. Basudeb Maji's research group (Chemogenetic Research Lab) at the Bose Institute works on the frontier of Chemical Biology and Biology problems. His research group mainly focuses on protein engineering and chemogenetics for precise cellular gene editing toward prospective gene therapy applications. His lab also focuses on developing synthetic small molecular probes for genetic and pathogenic diseases.

C. Experience and education

INSTITUTION AND LOCATION	POSITION/DEGREE	Date	FIELD OF STUDY
Bose Institute	Assistant Professor	12/22-	Biology
Ashoka University	Assistant Professor	12/20-12/22	Biology
Harvard Medical School, USA	Postdoctoral fellow	05/15-02/20	Chemical biology
Massachusetts Institute of Technology, USA	Postdoctoral fellow	10/16-09/17	Chemical biology
Indian Institute of Science, India	Research Associate	08/13-04/15	Organic Chemistry
Indian Institute of Science, India	Ph.D.	08/08-12/13	Organic Chemistry
Scottish Church College (University of Calcutta), India	M.Sc.	08/06-07/08	Organic Chemistry
University of Calcutta, India	B.Sc.	08/03-07/06	Chemistry

D. Publications

1. Cysteine-independent CRISPR-associated protein labeling for presentation and co-delivery of molecules toward genetic and epigenetic regulations. Sadiya Tanga, Arpita Hota, Arkadeep Karmakar, Paramita Banerjee, and Basudeb Maji*, *Chembiochem*, 2024, e202400149.
2. Nucleic acid editing (Nucleic acid biology and its application in human diseases): Springer Nature. Ayush Mistry, Sadiya Tanga, Basudeb Maji*. **2023**, Springer Nature. DOI <https://doi.org/10.1007/978-981-19-8520-1>
3. CRISPR-based Precision Molecular Diagnostics for Disease Detection and Surveillance. Akshara Kulkarni, Sadiya Tanga, Arkadeep Karmakar, Arpita Hota, and Basudeb Maji*, *ACS Applied Bio Materials*, **2023**, 6, 10, 3927–3945.
4. Emerging trends in precision drug and gene delivery. Sadiya Tanga and Basudeb Maji*. *Applied NANOMEDICINE*, **2022**, 22, 429
5. A general approach to identify cell-permeable, miniature, and synthetic anti-CRISPRs. Donghyun Lim, Qingxuan Zhou, Kurt Cox, Benjamin Law, Miseon Lee, Praveen Kokkonda, Santosh Chaudhary, Rajaiah Pergu, Vedagopuram Sreekanth, Soumyashree Gangopadhyay, Basudeb Maji, Sophia Lai, Yuka Amako, David Thompson, Hari Subramanian, Michael Mesleh, Vlado Dančik, Paul Clemons, Bridget Wagner, Christina Woo, and George Church, Amit Choudhary. *Nature Cell Biology*, **2022**, 24, 1766-1775.
6. Kei Yamada+, Arghya Deb+, Veronika M. Shoba, Donghyun Lim, Basudeb Maji, Ashley E. Modell, and

- Amit Choudhary*. Rational Design of Silicon-Based Zinc Ionophores with Antibacterial Activity. **Angew. Chem. Int.**, **2022**, 61, e202201698.
7. Sevim Kahraman, Debasish Manna, Ercument Dirice, Basudeb Maji, Jonnell Small, Bridget Wagner, Amit Choudhary, and Rohit Kulkarni. Harnessing Reaction-Based Probes to Preferentially Target Pancreatic b-Cells and b-Like Cells. **Life Science Alliance**, **2021**, 4, e202000840.
 8. M Lee[#], B Maji[#], D Manna[#], Sevim Kahraman, Ruth M. Elgamal, Jonnell Small, Amedeo Vetere, Jacob M. Goldberg, Stephen J. Lippard, Rohit N. Kulkarni, Bridget K. Wagner, and Amit Choudhary. Zinc catalyzes selective and traceless release of small molecules in beta cells. [#]Equal contribution. **Journal of the American Chemical Society**, **2020**, 142, 14, 6477–6482.
 9. B Maji, SA Gangopadhyay, M Lee, M Shi, P Wu, R Heler, B Mok, , D Lee, B Paul, V Dančik, MF Mesleh, A Vetere, LA Marraffini, DR Liu, PA Clemons, BK Wagner and A Choudhary. A high- throughput platform to identify small-molecule inhibitors of CRISPR-Cas9. **Cell**, **2019**, 167, 1067- 1079. Highlighted in more than 12 science media reports.
 10. B Maji,^a CL Moore,^a B Zetsche, SE Volz, F Zhang, MD Shoulders and A Choudhary. Multi-Dimensional Chemogenic Control of CRISPR-Cas9. **Nature Chemical Biology**, **2017**, 13, 9-11. ^aEqual contribution. (Highlighted by Nat. Chem. Biol. News & Views. doi: 10.1038/nchembio.2243.)
 11. D Manna, B Maji, S. Gangopadhyay, and A Choudhary. A singular system with precise dosing and spatiotemporal control of CRISPR-Cas9. **Angew. Chem. Int.**, **2019**, 58, 6285-6289.
 12. SA Gangopadhyay, K Cox, D Manna, D Lim, B Maji, Q Zhou and A Choudhary. Precision control of CRISPR-Cas9 using small molecules and light. **Biochemistry**, **2019**, 58, 234–244.
 13. MH Kaulage,^a B Maji,^a S Pasadi, A Ali, S Bhattacharya and K Muniyappa. Targeting G-quadruplex DNA structures in the telomere and oncogene promoter regions by benzimidazole–carbazole ligands. **European Journal of Medicinal Chemistry**, **2018**, 148, 178-194. ^aEqual contribution.
 14. N Dey, B Maji and S Bhattacharya. Motion Induced Change in Emission as an Effective Strategy for Ratiometric Probing of Human Serum Albumin and Trypsin in a Wide Range of Biological Fluids. **Chemistry – An Asian Journal**, **2018**, 13, 664-671.
 15. N Dey, B Maji and S Bhattacharya. A Unique Example of Excitation Triggered Alteration in Sensing Behavior of Fluorescent Organic Nanoaggregates: A Multifaceted Detection Probe for Caffeine in Real-Life Samples. **Analytical Chemistry**, **2018**, 90, 821–829.
 16. MH Kaulage, B Maji, S Pasadi, S Bhattacharya and K Muniyappa. Novel ruthenium azo-quinoline complexes with enhanced photonuclease activity in human cancer cells. **European Journal of Medicinal Chemistry**, **2017**, 139, 1016-1029.
 17. T Hussain, D Saha, G Purohit, A Kar, A Mukherjee, S Sharma, S Sengupta, P Dhapola, B Maji et al. Transcriptional control of CDKN1A (p21/CIP1/WAF1) by TRF2 through the REST repressor complex. **Scientific Reports**, **2017**, 7, 11541.
 18. M Kaulage, B Maji, J Bhat, Y Iwasaki, S Chatterjee, S Bhattacharya, K Muniyappa. Discovery and Structural Characterization of G-quadruplex DNA in Human Acetyl-CoA Carboxylase Gene Promoters: Its Role in Transcriptional Regulation and as a Therapeutic Target for Human Disease. **Journal of Medicinal Chemistry**, **2016**, 59, 5035-5050.
 19. B Maji, K Kumar, K Muniyappa, and S. Bhattacharya, New dimeric carbazole–benzimidazole mixed ligands for the stabilization of human telomeric G-quadruplex DNA and as telomerase inhibitors. A remarkable influence of the spacer. **Organic & Biomolecular Chemistry**, **2015**, 13, 8335-8348
 20. B Maji, K Kumar, M Kaulage, K Muniyappa and S Bhattacharya, Design and Synthesis of New Benzimidazole–Carbazole Conjugates for the Stabilization of Human Telomeric DNA, Telomerase Inhibition, and Their Selective Action on Cancer Cells. **Journal of Medicinal Chemistry**, **2014**, 57, 6973-6988.
 21. B Maji and S Bhattacharya, Advances in the molecular design of potential anticancer agents via targeting of human telomeric DNA. **Chemical Communications**. **2014**, 50, 6422-6438.
 22. B Maji, SK Samanta and S Bhattacharya, Role of DNA Secondary Structures in the Reversible

Dispersion/Precipitation and Separation of Metallic and Semiconducting Single-walled Carbon Nanotubes. **Nanoscale**, **2014**, 6, 3721-3730.

23. B Maji and S Bhattacharya, Molecular design of synthetic benzimidazoles for the switchover of the duplex to G-quadruplex DNA recognition. **Chimia** **2013**, 67, 39-43.
24. A Paul, B Maji, SK Misra, AK Jain, K Muniyappa and S Bhattacharya, Stabilization and structural alteration of the G-quadruplex DNA made from the human telomeric repeat mediated by Tröger's base based novel benzimidazole derivatives. **Journal of Medicinal Chemistry**, **2012**, 55, 7460-7471.
25. A Paul, AK Jain, SK Misra, B Maji, K Muniyappa and S Bhattacharya, Binding of gemini bisbenzimidazole drugs with human telomeric G-quadruplex dimers: Effect of the spacer in the design of potent telomerase inhibitors. **PLoS ONE**, **2012**, 7, e39467.
26. AK Jain, A Paul, B Maji, SK Misra, K Muniyappa and S Bhattacharya, Dimeric 1,3-Phenylenebis(piperazinyl benzimidazole)s: Synthesis and structure-activity investigations on their binding with human telomeric G-quadruplex DNA and telomerase inhibition properties. **Journal of Medicinal Chemistry**, **2012**, 55, 2981-2993.
27. AD Tiwari, AK Mishra, SB Mishra, BB Mamba, B Maji and S Bhattacharya, Synthesis and DNA binding studies of Ni(II), Co(II), Cu(II) and Zn(II) metal complexes of N 1,N 5-bis[pyridine-2-methylene]-thiocarbohydrazone Schiff-base ligand. **Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy**, **2011**, 79, 1050-1056.

Patents

1. CRISPR-CAS systems having destabilization domains, US Patent WO/2018/005,873, 2018.
2. Inhibitors of RNA guided nucleases and uses thereof. Pub. No.: WO/2018/085288. Publication Date:11.05.2018.
3. Inhibitor of RNA guided nucleases and uses thereof. U.S. Provisional Patent Application No. 62/765,357.
4. Targeted delivery to beta cells. US patent WO/2018/195, 486, 2018.
5. Methods and compositions for optochemical control of crispr-cas9. Broad Ref: BI-10404, 2018.
6. Crispr protein inhibitors, U.S. Provisional Patent Application No. 62/579,727.

E. Positions and Honors

2021	Ramalingaswami Re-entry Fellowship	DBT, Gol
2020	Assistant Professor of Biology and Chemistry	Ashoka University, Haryana, India
2020	Invited speaker for Nobel Prize 2020 Lecture	Raman Research Institute, Bangalore
2018	Invited Speaker at Nature Chemical Biology conference	New York University, NY, USA
2017	Top 10 Retreat poster of the year 2017	Broad Institute, Cambridge, MA, USA
2016	Partners Innovation Discovery Award	Brigham and Women's Hospital, MA, USA
2016	Postdoctoral Fellow	Department of Chemistry, MIT, MA, USA.
2016	Broad Next10 Research grant	Broad Institute of MIT and Harvard, MA, USA.
2015	Postdoctoral Research Fellow	Harvard Medical School, MA, USA.
2013	Junior and Senior Research Associate Fellowship	Indian Institute of Science, Bangalore, India.
2008-2013	Junior and Senior Research Fellowship, Council of Scientific and Industrial Research (CSIR) and Lectureship Fellowship	Ministry of Human Resource Development, Govt. of India.
2006	Postgraduate Academic Excellence Scholarship	Foundation for Academic Excellence and Access (FAEA), New Delhi, India.
2004	Undergraduate Academic Excellence Scholarship	Foundation for Academic Excellence and Access (FAEA), New Delhi, India.

F. Research Fundings

1. BN10, Broad Next10
7/2016–6/2017
PI: Basudeb Maji
2. Ashoka University seed grant
2020-2025
3. Ramalingaswami Reentry Fellowship, DBT
2021-26
PI: Basudeb Maji
4. IIT Delhi – Ashoka research grant
2021-2022
PI: Basudeb Maji and Soumik Siddhanta
5. Start-up Research Grant (SERB)
2021-2023
PI: Basudeb Maji
6. Bose Institute Intramural Research Fund
2022-
PI: Basudeb Maji