

Dibyendu Samanta, Ph. D.

Associate Professor

Department of Bioscience and Biotechnology

Indian Institute of Technology Kharagpur, India

E. mail: dibyendu.samanta@iitkgp.ac.in

Tel (office): (03222)284576

Professional Experiences

Associate Professor (May, 2023- present)

School of Bioscience, Indian Institute of Technology Kharagpur, India

Assistant Professor (2015- 2023)

School of Bioscience, Indian Institute of Technology Kharagpur, India

Associate Faculty (2013-2015)

Department of Biochemistry, Albert Einstein College of Medicine, New York, USA

Education/Training

Post-Doctoral (2009-2013)

Department of Microbiology & Immunology, Albert Einstein College of Medicine, NY, USA

Ph. D. (2004-2009)

Department of Biophysics and Molecular Biology, University of Calcutta, India

Award/Honors

International	Editorial Board member, <i>Frontiers in Cell and Developmental Biology</i> , 2023-present
	Review Editor, <i>Frontiers in Chemical Biology</i> 2016 – 2021
National	Early Career Research Award (ECRA) by SERB, Government of India, 2017-2020
	CSIR Junior and Senior Research Fellowships, CSIR, Government of India, 2004 – 2009
	CSIR-National Eligibility Test (NET), CSIR, Government of India, 2003
	Graduate Aptitude Test in Engineering (GATE), Department of Education, MHRD, Government of India, 2003

Research Area

Cell adhesion biology, Structure-function relationship of cell surface proteins: nectins and cadherins, Cadherins in host-pathogen interaction, Molecular and structural basis of T cell costimulation.

Research Activities

	Number completed	Number (ongoing)
Publications in referred international journals	32	
Publications in proceedings of seminars/conferences	6	
PhD Students' Thesis	5	5
Master Students' Thesis	8	2
Extramural Projects	2	2

Teaching

Science of Living System (BS10003 & BS20001)
Cell and Molecular Biology (BT20204)
Genetics and Genetic Engineering (BT31201)
Advances in Protein Structure and Function (BS41004)
Microbial Genetics and Genetic Engineering (MM40005)
Recombinant DNA Technology Laboratory (BT69016)

Publication in SCI Indexed Journals

1. Hansda A, Goswami S, Mukherjee S, Basak AJ, Dasgupta S, Roy PK, **Samanta D**, Mukherjee G. N-terminal ectodomain of BTNL2 inhibits T cell activation via a non-canonical interaction with its putative receptor that results in a delayed progression of DSS-induced ulcerative colitis, *Mol Immunol*. 2024, 13;166:39-49.
2. Mukherjee S, Goswami S, Dash S, **Samanta D**. Structural basis of molecular recognition among classical cadherins mediating cell adhesion. *Biochem. Soc. Trans*. 2023, 16;51(6):2103-15.
3. Pandey N, Mandal M, **Samanta D**, Mukherjee G, Dutta G. A nanobody based ultrasensitive electrochemical biosensor for the detection of soluble CTLA-4 –A candidate biomarker for cancer development and progression, *Biosens. Bioelectron*. 2023, 242:115733.

4. Mahata D, Mukherjee D, Biswas D, Basak S, Basak AJ, Jamir I, Pandey N, Khatoon H, **Samanta D**, Basak A, Mukherjee G. Activation and differentiation of cognate T cells by a dextran-based antigen-presenting system for cancer immunotherapy. *Eur J Immunol*. 2023, 53(12):e2350528.
5. Ganguli N, Kumari P, Dash S, **Samanta D**. Molecular and structural basis of TIGIT: Nectin-4 interaction, a recently discovered pathway crucial for cancer immunotherapy, *Biochem Biophys Res Commun*. 2023, 677:31-37.
6. Goswami S, **Samanta D**, Duraivelan, K. Molecular mimicry of host short linear motif-mediated interactions utilised by viruses for entry. *Mol Biol Rep*. 2023, 50, 4665-4673.
7. Dash S, Duraivelan K, Hansda A, Kumari P, Chatterjee S, Mukherjee G, **Samanta D**. Heterophilic recognition between E-cadherin and N-cadherin relies on same canonical binding interface as required for E-cadherin homodimerization. *Arch Biochem Biophys*. 2022, 727:109329. doi: 10.1016/j.abb
8. Chatterjee S, Kundapura SV, Basak AJ, Mukherjee D, Dash S, Ganguli N, Das AK, Mukherjee G, **Samanta D**, Ramagopal UA. High-resolution crystal structure of LpqH, an immunomodulatory surface lipoprotein of Mycobacterium tuberculosis reveals a distinct fold and a conserved cleft on its surface. *Int J Biol Macromol*. 2022, 210:494-503.
9. Duraivelan K, **Samanta D**. Emerging roles of the nectin family of cell adhesion molecules in tumour-associated pathways. *Biochim Biophys Acta Rev Cancer*. 2021, 1876(2):188589.
10. Lankipalli S, H S MS, Selvam D, **Samanta D**, Nair D, Ramagopal UA. Cryptic association of B7-2 molecules and its implication for clustering. *Protein Sci*. 2021, 30(9):1958-1973.
11. Dash S, Duraivelan K, **Samanta D**. Cadherin-mediated host-pathogen interactions. *Cell Microbiol*. 2021, 23(5):e13316.
12. Chatterjee S, Basak AJ, Nair AV, Duraivelan K, **Samanta D**. Immunoglobulin-fold containing bacterial adhesins: molecular and structural perspectives in host tissue colonization and infection. *FEMS Microbiol Lett*. 2021, 368(2):fnaa220. doi: 10.1093/femsle/fnaa220
13. Duraivelan K, Dash S, **Samanta D**. An evolutionarily conserved charged residue dictates the specificity of heterophilic interactions among nectins. *Biochem Biophys Res Commun*. 2021, 534:504-510.
14. Basak AJ, Maiti S, Hansda A, Mahata D, Duraivelan K, Kundapura SV, Lee W, Mukherjee G, De S, **Samanta D**. Structural Insights into N-terminal IgV Domain of BTNL2, a T Cell Inhibitory Molecule, Suggests a Non-canonical Binding Interface for Its Putative Receptors. *J Mol Biol*. 2020, 432(22):5938-5950.
15. Duraivelan K, **Samanta D**. Tracing the evolution of nectin and nectin-like cell adhesion molecules. *Sci Rep*. 2020, 10(1):9434.

16. Ng SL, Leno-Duran E, **Samanta D**, Almo SC, Strominger JL. Genetically modified hematopoietic stem/progenitor cells that produce IL-10-secreting regulatory T cells. *Proc Natl Acad Sci USA*. 2019, 116(7):2634-2639.
17. Duraivelan K, Basak AJ, Ghosh A, **Samanta D**. Molecular and structural bases of interaction between extracellular domains of nectin-2 and N-cadherin. *Proteins*. 2018, 86(11):1157-1164.
18. Das D, **Samanta D**, Bhattacharya A, Basu A, Das A, Ghosh J, Chakrabarti A, DasGupta C. A Possible Role of the Full-Length Nascent Protein in Post-Translational Ribosome Recycling. *PLoS One*. 2017, 18;12(1):e0170333.
19. **Samanta D**, Guo H, Rubinstein R, Ramagopal UA, Almo SC. Structural, mutational and biophysical studies reveal a canonical mode of molecular recognition between immune receptor TIGIT and nectin-2. *Mol Immunol*. 2017, 81:151-159.
20. **Samanta D**, Almo SC. Nectin family of cell-adhesion molecules: structural and molecular aspects of function and specificity. *Cell Mol Life Sci*. 2015, 72(4):645-58.
21. Lamont D, Mukherjee G, Kumar PR, **Samanta D**, McPhee CG, Kay TW, Almo SC, DiLorenzo TP, Serreze DV. Compensatory mechanisms allow undersized anchor-deficient class I MHC ligands to mediate pathogenic autoreactive T cell responses. *J Immunol*. 2014, 1;193(5):2135-46.
22. Pang Y, Kurella S, Voisset C, **Samanta D**, Banerjee D, Schabe A, Das Gupta C, Galons H, Blondel M, Sanyal S. The antiprion compound 6-aminophenanthridine inhibits the protein folding activity of the ribosome by direct competition. *J Biol Chem*. 2013 28;288(26):19081-9.
23. Das D, **Samanta D**, Hasan S, Das A, Bhattacharya A, Dasgupta S, Chakrabarti A, Ghorai P, Das Gupta C. Identical RNA-protein interactions in vivo and in vitro and a scheme of folding the newly synthesized proteins by ribosomes. *J Biol Chem*. 2012, 26;287(44):37508-21.
24. **Samanta D**, Ramagopal UA, Rubinstein R, Vigdorovich V, Nathenson SG, Almo SC. Structure of Nectin-2 reveals determinants of homophilic and heterophilic interactions that control cell-cell adhesion. *Proc Natl Acad Sci USA*. 2012, 11;109(37):14836-40.
25. Das A, Ghosh J, Bhattacharya A, **Samanta D**, Das D, Das Gupta C. Involvement of mitochondrial ribosomal proteins in ribosomal RNA-mediated protein folding. *J Biol Chem*. 2011, 23;286(51):43771-81.
26. **Samanta D**, Mukherjee G, Ramagopal UA, Chaparro RJ, Nathenson SG, DiLorenzo TP, Almo SC. Structural and functional characterization of a single-chain peptide-MHC molecule that modulates both naive and activated CD8+ T cells. *Proc Natl Acad Sci USA*. 2011, 16;108(33):13682-7.
27. Das D, **Samanta D**, Das A, Ghosh J, Bhattacharya A, Basu A, Charkrabarti A, Dasgupta C. Ribosome: the structure-function relation and a new paradigm to the protein folding Problem. *Israel J Chem*. 2010, 50:109-116.

28. **Samanta D**, Das A, Bhattacharya A, Basu A, Das D, DasGupta C. Mechanism of ribosome assisted protein folding: a new insight into rRNA functions. *Biochem Biophys Res Commun*. 2009, 26;384(2):137-40.
29. Das D, Das A, **Samanta D**, Ghosh J, Dasgupta S, Bhattacharya A, Basu A, Sanyal S, Das Gupta C. Role of the ribosome in protein folding. *Biotechnol J*. 2008, 3(8):999-1009.
30. **Samanta D**, Mukhopadhyay D, Chowdhury S, Ghosh J, Pal S, Basu A, Bhattacharya A, Das A, Das D, DasGupta C. Protein folding by domain V of *Escherichia coli* 23S rRNA: specificity of RNA-protein interactions. *J Bacteriol*. 2008, 190(9):3344-52.
31. Basu A, **Samanta D**, Das D, Chowdhury S, Bhattacharya A, Ghosh J, Das A, Dasgupta C. In vitro protein folding by *E. coli* ribosome: unfolded protein splitting 70S to interact with 50S subunit. *Biochem Biophys Res Commun*. 2008, 8;366(2):598-603.
32. Basu A, **Samanta D**, Bhattacharya A, Das A, Das D, Dasgupta C. Protein folding following synthesis in vitro and in vivo: association of newly synthesized protein with 50S subunit of *E. coli* ribosome. *Biochem Biophys Res Commun*. 2008, 8;366(2):592-7.

Book chapter

1. **Samanta D**, Das A, Das D, Bhattacharya A, Basu A, Ghosh J, DasGupta C. Ribosome assisted protein folding: Some of its biological implications. In Protein Folding 2011. (pp. 377-399). Nova Science Publishers, Inc.