

Full name Dr. Sanghamitra Sengupta
Designation Professor and Head, Department of Biochemistry
Specialization Molecular Biology and Genomics
Passport size photograph



Contact

Department of Biochemistry, University of Calcutta
35, Ballygunge Circular Road, Kolkata-700019, West Bengal, India
Email: sanghamitrasg@yahoo.com, ssbioc@caluniv.ac.in Mobile: 9830340481

Academic Qualifications

College/ University	Degree
Bethune College, University of Calcutta	B. Sc. in Chemistry Honours
University of Calcutta	M. Sc. in Biochemistry
University of Calcutta	Ph.D. in Biochemistry (Indian Institute of Chemical Biology)

Honours/Awards

Fellow, West Bengal Academy of Science and Technology

Research and Teaching experiences

- Post-Doctoral Fellow: Department of Genetics, Case Western Reserve University, Cleveland, Ohio, USA, 1998- 2000.
- Senior Research Associate, Human Genetics Unit, Indian Statistical Institute, Kolkata, 2001-2005
- Visiting Scientist, Department of Genetics, Stanford University, Stanford, CA, USA, 2002
- Lecturer, Dept. of Biochemistry, University of Calcutta, April, 2005
- Assistant Professor (stage II & III): April 2009- March 2017
- Associate Professor, April 2017-March 2020
- Professor, April 2020 till date

Research Interest

To decipher the biological processes perturbed in complex diseases namely human malaria, prostate cancer and type 2 diabetes mellitus towards developing improved strategies for the prediction of disease risk and prevention of diseases progression.

Research guidance

Number of scholars awarded Ph.D. degrees: 9

Number of researchers pursuing Ph.D. degree: 5

Number of researchers submitted Ph.D. Thesis: 3

Present Lab-members

Stuti Roy

Supti Das

Nahid Sultana

Akshsmita Somani

Past Lab members

- Dr. Madhumita Basu, Senior Scientist, Target Discovery, MelliCell Inc, Greater Boston
- Dr. Shyamalina Halder, Assistant Professor, Department of Biochemistry, Asutosh College, Kolkata
- Dr. Ankur Bhowal, Assistant Professor, Department of Zoology, Vidyasagar College, Kolkata
- Dr. Subhadipa Majumder, Assistant Professor, Department of Zoology, Surendranath College and Vidyasagar, Kolkata
- Dr. Sanmitra Basu, Assistant Professor, Department of Microbiology, Adamas University
- Dr. Teesta Naskar, Post-doctoral researcher at Ichan School of Medicine at Mount Sinai
- Dr. Pramita Chowdhury, State Consultant- Population Control, National Health Mission
- Sharmistha Ghoshal
- Deepmala Karmakar, IIT Roorkee
- Bijurica Chakraborty, MRU, NRS Medical College and Hospital

Completed Projects

- Role of SNPs in the central MHC complex in malarial pathogenesis, DST-SERC- FastTrack, 2005-2008
- Investigating the role of TLR in *P. falciparum* mediated malarial Pathogenesis, UGC Major Project , 2008-2011
- Impact of Polymorphisms in the Candidate Genes on Prostate Cancer: Association & Functional Analyses, CSIR Extramural Research Grant Scheme, 2009-2012
- Studying the molecular basis of progression of prostate cancer, UGC/UPE/Modern Biology, 2009-2012
- Investigating Molecular Principles of Species Interaction in Rhizosphere: Biochemical and Metagenomic Approaches, UGC/UPE/Modern Biology, 2007-2012 (as one of the co- PIs)
- Elucidation of rhizosphere-effect of *Arachis hypogea*: Its potential biotechnological application, DBT, Govt. of West Bengal, 2011-2014
- Invetorisation & Database Creation on Microbial Diversity along Indian Coast,
- National Centre for sustainable Coastal Management, Ministry of Environment and Forests (as a Co-PI), 2013-2015
- Towards understanding host gene regulation in *p. falciparum* malaria: An insight into disease pathogenesis, SERB, DST, New Delhi, 2014-2017
- Decoding the Genetics of Host-Parasite Interaction during Erythrocyte Invasion by *Plasmodium falciparum* in Human malaria, University Grants Commission, New Delhi, 2015-2018
- Elucidating the function of TGF β pathway in prostate carcinogenesis, Indian Council of Medical Research, New Delhi, 2015-2018

- Plasmodium falciparum Merozoite Invasion of Human Erythrocytes: Genetic Perspective & Implications, Dept. of Biotechnology, Govt. of WB, 2015-2019
- Received UPE-II project for the year 2017-2020 as a Project Coordinator and Group Leader: Bacterial Colonization (Thrust area: Plant-microbe interaction)

Ongoing Projects

- A collaborative project with Dr. Basudev Lahiri, IIT-KGP entitled "FTIR based ultrafast detection and quantitative assessment of COVID-19 viral load" funded by Science & Engineering Research Board (SERB) Govt. of India
- UGC-DAE CSR funded research project entitled Delineating precise stages of breast cancer progression using molecular fingerprints generated by infrared vibrational spectroscopy

Publications

Google Scholar Citations: 2311, h index=21, i10-index=34 Date of accession: February 9, 2023

1. Prevalence of non-diabetic kidney disease and inability of clinical predictors to differentiate it from diabetic kidney disease: results from a prospectively performed renal biopsy study. Basu M, Pulai S, Neogi S, Banerjee M, Bhattacharyya NP, Sengupta S, Mukhopadhyay P, Ray Chaudhury A, Ghosh S. *BMJ Open Diabetes Res Care*. 2022 Dec;10(6):e003058. doi: 10.1136/bmjdr-2022-003058. PMID: 36517108
2. Plasmodium vivax vaccine candidate MSP1 displays conserved B-cell epitope despite high genetic diversity. Ghoshal S, Datta Kanjilal S, Sengupta S. *Infect Genet Evol*. 2021 May 20;93:104929. doi: 10.1016/j.meegid.2021.104929
3. Molecular crosstalk between CUEDC2 and ER α influences the clinical outcome by regulating mitosis in breast cancer. Roy S, Saha S, Dhar D, Chakraborty P, Singha Roy K, Mukherjee C, Gupta A, Bhattacharyya S, Roy A, Sengupta S, Roychoudhury S, Nath S. *Cancer Gene Ther*. 2022 Nov;29(11):1697-1706. doi: 10.1038/s41417-022-00494-x. Epub 2022 Jun 22. PMID: 35732909
4. Adiponectin Genetic Variant and Expression Coupled with Lipid Peroxidation Reveal New Signatures in Diabetic Dyslipidemia. Ghoshal K, Chatterjee T, Chowdhury S, Sengupta S, Bhattacharyya M. *Biochem Genet*. 2021 Jun;59(3):781-798. doi: 10.1007/s10528-021-10030-5. Epub 2021 Feb 4. PMID: 33543406
5. Road Map to Understanding SARS-CoV-2 Clinico-Immunopathology and COVID-19 Disease Severity. Karmakar D, Lahiri B, Ranjan P, Chatterjee J, Lahiri P, Sengupta S. *Pathogens*. 2020 Dec 23;10(1):5. doi: 10.3390/pathogens10010005. PMID: 33374748
6. Population genetic and biophysical evidences reveal that purifying selection shapes the genetic landscape of Plasmodium falciparum RH ligands in Chhattisgarh and West Bengal, India. Ghoshal S, Chowdhury P, Ray S, Mitra M, Kanjilal SD, Sen S, Dasgupta AK, Sengupta S. *Malar J*. 2020 Oct 14;19(1):367. doi: 10.1186/s12936-020-03433-z. PMID: 33054833
7. Non-synonymous amino acid alterations in PfEBA-175 modulate the merozoite ligand's ability to interact with host's Glycophorin A receptor. Chowdhury P, Ray S, Chakraborty A, Sen S, Dasgupta AK, Sengupta S. *Infect Genet Evol*. 2020 Nov;85:104418. doi: 10.1016/j.meegid.2020.104418. Epub 2020 Jun 16. PMID: 32561295
8. E2F5 promotes prostate cancer cell migration and invasion through regulation of TFPI2, MMP-2 and MMP-9. Karmakar D, Maity J, Mondal P, Shyam Chowdhury P, Sikdar N, Karmakar P, Das C, Sengupta S. *Carcinogenesis*. 2020 Dec 31;41(12):1767-1780. doi: 10.1093/carcin/bgaa043. PMID: 32386317

9. Evaluating the role of hsa-miR-200c in reversing the epithelial to mesenchymal transition in prostate cancer. Basu S, Chaudhary A, Chowdhury P, Karmakar D, Basu K, Karmakar D, Chatterjee J, Sengupta S. *Gene*. 2020 Mar 10;730:144264. doi: 10.1016/j.gene.2019.144264. Epub 2019 Nov 21. PMID: 31759982
10. Diversity analysis of MSP1 identifies conserved epitope organization in block 2 amidst high sequence variability in Indian Plasmodium falciparum isolates. Ghoshal S, Gajendra P, Datta Kanjilal S, Mitra M, Sengupta S. *Malar J*. 2018 Dec 3;17(1):447. doi: 10.1186/s12936-018-2592-y.
11. Deciphering genetic regulation of CD14 by SP1 through characterization of peripheral blood mononuclear transcriptome of P. faiciparum and P. vivax infected malaria patients. Chakraborty B, Mondal P, Gajendra P, Mitra M, Das C, Sengupta S. *EBioMedicine*. 2018 Nov;37:442-452.
12. Endorsing cellular competitiveness in aberrant epithelium of oral submucous fibrosis progression: neighbourhood analysis of immunohistochemical attributes. Anura A, Kazi A, Pal M, Paul RR, Sengupta S, Chatterjee J. *HistochemCell Biol*. 2018 Jul;150(1):61-75
13. Ancestral Variations of the PCDHG Gene Cluster Predispose to Dyslexia in a Multiplex Family. Naskar T, Faruq M, Banerjee P, Khan M, Midha R, Kumari R, Devasenapathy S, Prajapati B, Sengupta S, Jain D, Mukerji M, Singh NC, Sinha S. *EBioMedicine*. 2018 Feb;28:168-179
14. Liaison between heme metabolism and bioenergetics pathways-a multimodal elucidation for early diagnosis of oral cancer. Sarkar R, Chatterjee K, Ojha D, Chakraborty B, Sengupta S, Chattopadhyay D, RoyChaudhuri C, Barui A. *Photodiagnosis Photodyn Ther*. 2018 Mar;21:263-274
15. Genetic structure of two erythrocyte binding antigens of Plasmodium falciparum reveals a contrasting pattern of selection. Chowdhury P, Sen S, Kanjilal SD, Sengupta S. *Infect Genet Evol*. 2018 Jan;57:64-74.
16. Pathway-based expression profiling of benign prostatic hyperplasia and prostatecancer delineates an immunophilin molecule associated with cancer progression. Bhowal A, Majumder S, Ghosh S, Basu S, Sen D, Roychowdhury S, Sengupta S, Chatterji U. *Sci Rep*. 2017 Aug 29;7(1):9763. doi: 10.1038/s41598-017-10068-9.
17. Fourier transform infra-red spectroscopic signatures for lung cells' epithelial mesenchymal transition: A preliminary report. Sarkar A, Sengupta S, Mukherjee A, Chatterjee J. *Spectrochim Acta A Mol Biomol Spectrosc*. 2017 Feb 15;173:809-816. doi: 10.1016/j.saa.2016.10.019. Epub 2016 Oct 17.
18. Distribution and source identification of heavy metal concentration in Chilika Lake, Odisha India: an assessment over salinity gradient. 10 January 2017, 112(01)
19. Deregulated E2F5/p38/SMAD3 Circuitry Reinforces the Pro-Tumorigenic Switch of TGFβ Signaling in Prostate Cancer. *J Cell Physiol*. 2016 Nov;231(11):2482-92.
20. Identification and functional assessment of novel gene sets towards better understanding of dysplasia associated oral carcinogenesis. *Gene Reports*. 2016 Sep, 131- 138
21. Female reproductive tract microbiome in gynecological health and problems. Shyamalina Haldar, Arti Kapil, Seema Sood, Sanghamitra Sengupta. *Journal of Reproductive Health and Medicine*. November 2016. DOI: 10.1016/j.jrhm.2016.11.007
22. Metagenomic exploration of the bacterial community structure at Paradip Port, Odisha, India. Pramanik A, Basak P, Banerjee S, Sengupta S, Chattopadhyay D, Bhattacharyya M. *Genom Data*. 2015 Dec 17;7:94-6.
23. A study of molecular signals deregulating mismatch repair genes in prostate cancer compared to benign prostatic hyperplasia. *PLoS One*. 2015 May 4;10(5)
24. Impact of plant development on the rhizobacterial population of Arachis hypogaea: a multifactorial analysis. *J Basic Microbiol*. 2015 Jul;55(7):922-8.

25. Pyrosequencing based profiling of the bacterial community in the Chilika Lake, the largest lagoon of India. *Genom Data*. 2015 Apr 11;4:112-4.
26. Plant-microbe Cross-talk in the Rhizosphere: Insight and Biotechnological Potential. *Open Microbiol J*. 2015 Mar 31;9:1-7.
27. Oxidative stress-related genes in type 2 diabetes: association analysis and their clinical impact. *Biochem Genet*. 2015 Jun;53(4-6):93-119.
28. Association of MTHFR 677C>T genetic polymorphism with hyperhomocysteinemia in type 2 diabetes patients. Arpita Chakraborty, Arindam Chakraborty, Subhankar Chowdhury, Sanghamitra Sengupta, Maitree Bhattacharyya;; *Cogent Medicine* (2015), 2: 1017973
29. Computational analysis of p63(+) nuclei distribution pattern by graph theoretic approach in an oral pre-cancer (sub-mucous fibrosis). Bag S, Conjeti S, Das RK, Pal M, Anura A, Paul RR, Ray AK, Sengupta S, Chatterjee J. *J Pathol Inform*. 2013 Dec 31;4:35.
30. A closed-loop control scheme for steering steady states of glycolysis and glycogenolysis pathway. Panja S, Patra S, Mukherjee A, Basu M, Sengupta S, Dutta PK. *IEEE/ACM Trans Comput Biol Bioinform*. 2013 Jul-Aug;10(4):858-68. doi:10.1109/TCBB.2013.82.
31. Epithelio-mesenchymal transitional attributes in oral sub-mucous fibrosis. Das RK, Anura A, Pal M, Bag S, Majumdar S, Barui A, Chakraborty C, Ray AK, Sengupta S, Paul RR, Chatterjee J. *Exp Mol Pathol*. 2013 Dec;95(3):259-69. doi: 10.1016/j.yexmp.2013.08.006. Epub 2013 Aug 30.
32. Natural selection and population genetic structure of domain-I of Plasmodium falciparum apical membrane antigen-1 in India. Basu M, Maji AK, Mitra M, Sengupta S. *Infect Genet Evol*. 2013 Aug;18:247-56. doi: 10.1016/j.meegid.2013.05.015. Epub 2013 Jun 6.
33. Assessment of molecular events during in vitro re-epithelialization under honey- alginate matrix ambience. Barui A, Mandal N, Majumder S, Das RK, Sengupta S, Banerjee P, Ray AK, Roy Chaudhuri C, Chatterjee J. *Mater Sci Eng C Mater Biol Appl*. 2013 Aug 1;33(6):3418-25. doi: 10.1016/j.msec.2013.04.034. Epub 2013 Apr 22.
34. Robustness of TCA cycle at steady-state: an LMI-based analysis and synthesis framework. Panja S, Patra S, Mukherjee A, Basu M, Sengupta S, Dutta PK. *IEEE Trans Nanobioscience*. 2013 Jun;12(2):128-34. doi: 10.1109/TNB.2013.2258679. Epub 2013 May 16.
35. An optimization-based design framework for steering steady states and improving robustness of glycolysis-glycogenolysis pathway. Panja S, Patra S, Mukherjee A, Basu M, Sengupta S, Dutta PK. *IEEE Trans Biomed Eng*. 2013 Feb;60(2):554-61. doi: 10.1109/TBME.2012.2230259. Epub 2012 Nov 29.
36. Gene-gene interaction and functional impact of polymorphisms on innate immune genes in controlling Plasmodium falciparum blood infection level. Basu M, Das T, Ghosh A, Majumder S, Maji AK, Kanjilal SD, Mukhopadhyay I, Roychowdhury S, Banerjee S, Sengupta S. *PLoS One*. 2012;7(10):e46441
37. Genetic and functional diversities of bacterial communities in the rhizosphere of Arachis hypogaea. Haldar S, Choudhury SR, Sengupta S. *Antonie Van Leeuwenhoek*. 2011 Jun;100(1):161-70.
38. Assessment of malignant potential of oral submucous fibrosis through evaluation of p63, E-cadherin and CD105 expression. Das RK, Pal M, Barui A, Paul RR, Chakraborty C, Ray AK, Sengupta S, Chatterjee J. *J Clin Pathol*. 2010 Oct;63(10):894-9. Cancer classification from gene expression data by NPPC ensemble. Ghorai S, Mukherjee A, Sengupta S, Dutta PK. *IEEE/ACM Trans Comput Biol Bioinform*. 2011 May-Jun;8(3):659-71.
39. Co-existence of risk and protective haplotypes of Calpain 10 gene to type 2 diabetes in the eastern Indian population. Adak S, Sengupta S, Chowdhury S, Bhattacharyya M. *Diab Vasc Dis Res*. 2010 Jan;7(1):63-8.

40. Genetic association of Toll-like-receptor 4 and tumor necrosis factor-alpha polymorphisms with Plasmodium falciparum blood infection levels. Basu M, Maji AK, Chakraborty A, Banerjee R, Mullick S, Saha P, Das S, Kanjilal SD, Sengupta S. *Infect Genet Evol.* 2010 Jul;10(5):686-96.
41. Separating the post-Glacial coancestry of European and Asian Y chromosomes within haplogroup R1a. Underhill PA, Myres NM, Rootsi S, Metspalu M, Zhivotovsky LA, King RJ, Lin AA, Chow CE, Semino O, Battaglia V, Kutuev I, Järve M, Chaubey G, Ayub Q, Mohyuddin A, Mehdi SQ, Sengupta S, Rogaev EI, Khusnutdinova EK, Pshenichnov A, Balanovsky O, Balanovska E, Jeran N, Augustin DH, Baldovic M, Herrera RJ, Thangaraj K, Singh V, Singh L, Majumder P, Rudan P, Primorac D, VILLEMS R, Kivisild T. *Eur J Hum Genet.* 2010 Apr;18(4):479-84.
42. Portability of tag SNPs across isolated population groups: an example from India NS Roy, S Farheen, N Roy, S Sengupta, PP Majumder. *Annals of human genetics* 72 (1), 82- 89
43. Patterns of nucleotide sequence variation in ICAM1 and TNF genes in twelve ethnic groups of India: roles of demographic history and natural selection. Sengupta S, Farheen S, Mukherjee N, Majumder PP. *J Genet.* 2007 Dec;86(3):225-39.
44. Gilbert's syndrome: High frequency of the (TA)₇ TAA allele in India and its interaction with a novel CAT insertion in promoter of the gene for bilirubin UDP- glucuronosyltransferase 1 gene. Farheen S, Sengupta S, Santra A, Pal S, Dhali GK, Chakravorty M, Majumder PP, Chowdhury A. *World J Gastroenterol.* 2006 Apr 14;12(14):2269-75.
45. Polarity and temporality of high-resolution y-chromosome distributions in India identify both indigenous and exogenous expansions and reveal minor genetic influence of Central Asian pastoralists. Sengupta S, Zhivotovsky LA, King R, Mehdi SQ, Edmonds CA, Chow CE, Lin AA, Mitra M, Sil SK, Ramesh A, Usha Rani MV, Thakur CM, Cavalli-Sforza LL, Majumder PP, Underhill PA. *Am J Hum Genet.* 2006 Feb;78(2):202-21. Epub 2005 Dec 16.
46. Single nucleotide polymorphisms in two genes among the Jarawa, a primitive tribe of the Andaman and Nicobar Islands | *Research Communications* | 25 January 2004, 86 (02)
47. DNA sequence variation and haplotype structure of the ICAM1 and TNF genes in 12 ethnic groups of India reveal patterns of importance in designing association studies. S Sengupta, S Farheen, N Mukherjee, B Dey, B Mukhopadhyay, SK Sil, P.P. Majumder. *Annals of human genetics* 68 (6), 574-587
48. Ethnic India: a genomic view, with special reference to peopling and structure. Basu A, Mukherjee N, Roy S, Sengupta S, Banerjee S, Chakraborty M, Dey B, Roy M, Roy B, Bhattacharyya NP, Roychoudhury S, Majumder PP. *Genome Res.* 2003 Oct;13(10):2277- 90
49. Rearrangements in the genomes of *Vibrio cholerae* strains belonging to different serovars and biovars. Nandi S, Khetawat G, Sengupta S, Majumder R, Kar S, Bhadra RK, Roychoudhury S, Das J. *Int J Syst Bacteriol.* 1997 Jul;47(3):858-62.
50. Physical map of the genome of *Vibrio cholerae* 569B and localization of genetic markers. Majumder R, Sengupta S, Khetawat G, Bhadra RK, Roychoudhury S, Das J. *J Bacteriol.* 1996 Feb;178(4):1105-12
51. Cholera toxin (CTX) genetic element in *Vibrio cholerae* O139. Bhadra RK, Roychoudhury S, Banerjee RK, Kar S, Majumdar R, Sengupta S, Chatterjee S, Khetawat G, Das J. *Microbiology.* 1995 Aug;141 (Pt 8):1977-83.

Book chapters

1. "An Overview of the Multifaceted Role of Plant Growth-Promoting Microorganisms and Endophytes in Sustainable Agriculture: Developments and Prospects" in *Microbial Symbionts and Plant Health: Trends and Applications for Changing Climate*, by Springer Nature.

2. Microbial Ecology at Rhizosphere: Bioengineering and Future Prospective; 63- 96, Plant-Microbe Interaction: An Approach to Sustainable Agriculture; Devendra K. Choudhary, Ajit Varma, Narendra Tuteja. Springer Nature, ISBN 978-981-10-2853-3
3. Volatiles in the Rhizosphere: Bioprospecting for Sustainable Agriculture and Food Security, 61-81, Volatiles and Food Security Role of Volatiles in Agro- ecosystems Devendra K. Choudhary · Anil K. Sharma, Prachi Agarwal · Ajit Varma, Narendra Tuteja, Springer, ISBN 978-981-10-5553-9

Membership in scientific bodies

- President, Calcutta-Chapter Human Genetics (CC-HuGe)
- Member of Executive Committee, Kolkata Chapter of Society of Biological Chemists (India) (SBC)
- Member of Indian Society of Human Genetics (ISHG)
- Member of Science Congress Association
- Member of Indian Association of Cancer Research (IACR)