Environmental Epigenomics Laboratory

Principal Investigator

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Brief Self Introduction

I did my PhD (2002-2007) from CSIR-Indian Institute of Chemical Biology, Jadavpur, Kolkata. I served as a pool-scientist in IICB for 2 years and then joined as an Assistant professor, Department of Environmental Science, University of Calcutta on Jan 8, 2013. At present I am working as Associate Professor (July 2023 onwards). My major area of interest includes - Environmental and Occupational Health, Epigenetic research, Trace metal toxicity, Waste management.

As a PhD supervisor 11 students completed their PhD work under my guidance and present 5 scholars are working. I am associated with some National and International projects. My Lab works in the field of Epigenetics.

Research Areas

- **Environmental Health highlighting Epigenetic-Research**
- **Nutri-epigenetics-**
- **Non-communicable lifestyle disorder PCOS and Obesity-**
- **Sustainable mitigation strategies for environmental and occupational health hazards-**
- **Behavioural epigenetics-**
- **Toxicogenomics & Health**

Research projects

Title of Project	Funding Agency	Duration
Trace Metal Analysis of Bio-fluids of Tuibur Consumers and Identification of its Cellular, Genetic and Epigenetic Targets.	**DBT-NER-Twinning Grant**	2019-2022
Nutritional and Environmental Hazards in Non-communicable diseases, obesity and cardiovascular risk	**UGC-UPE**	2017-2020 (Completed)
Comparative Study of Trace Elements in the Blood and Buccal Saliva of Arsenicosis and Cancer Patients using PIXIE & Its Relation with DNA Damage Progression	**UGC-DAE**	2016-2019 (Completed)
Promising Role of Black Tea Polyphenols as Epigenetic Modulator: A New Bridge Between Nutrition and Health	**NTRF**	2016-2019 (Completed)
Cardiovascular Disease in Children Exposed to Arsenic, Lead and Mercury.	**SUNY-OSWEGO, NY & Syracuse University (International Collaboration)**	2016-2019 (Completed)
Genetic Variation in Multidrug Resistance Gene *(MRP4)* in Arsenic Exposed Population of West Bengal	**University of Alberta, Canada (International Collaboration)**	2016-2017 (Completed)
Role of Epigenetic Modifications in Arsenic-Induced Toxicity and Carcinogenicity: with special reference to Histone Modification	**DST-Fast track**	2013 – 2016 (Completed)

Supervised PhD Research-

Candidate: Pritha Bhattacharjee ---**Awarded on 28.01.2020**
Role of Epigenetic Modification in Arsenic-induced toxicity and carcinogenicity: with special reference to Histone Modification
Candidate: KousikMondal**—Awarded on 12.11.2021**
Waste Hair Reprocessing and Adverse Health Outcome using Cytogenetic, Biochemical and Molecular biomarkers
Candidate: Tamalika Sanyal**—Awarded on 12.11.2021**
Impact of Arsenic Toxicity on Human Health:Role of Mitochondrial Genetic and Epigenetic Regulation
Candidate: Krishnendu Ghosh**—Awarded on 7.10.21**
Searching the Interplay between progression and Invasion with Microglial Imposition in Human Glioma Samples

Candidate: Ritwija Bhattacharya**—Awarded on 2.03.23**
Studies on the role of Black Tea in Cancer Epigenetics with special reference to DNA Methyl Transferase (DNMT) inhibition and Potential of Spent Tea Leaves for Biosorption of Industrial Dyes
Candidate: Sudipta Ray--- **Awarded on 7.04.22**
Impact of Climate Change on Agriculture in Developing Countries with Special Reference to India: Minimization of Adverse Effects through Eco-sustainable Agriculture Particularly the Use of Seed Invigoration Treatment to Tide Over Adverse Agro Climatological Effects
Candidate: Shuvam Banerjee--- **Awarded on 29.12.23**
Assessment of Heavy Metal Exposure and Bioinformatics Based Genetic Variant Analysis to Predict Few Reported Disease Susceptibility
Candidate: Anupa Yadav--- **PhD. Pursuing (Thesis submitted)**
Study on the Impact of Carcinogenic Air Pollutants through Urinary Metabolites, Altered Lung Function and Cognition Pattern Analyses in a Targeted Population from West Bengal, India
Candidate: Shrinjana Dhar--- **PhD. Pursuing (Thesis submitted)**
Polycystic Ovarian Syndrome (PCOS) against the Exposure to Bisphenol-A & Related Studies in the Context of Genetic Susceptibility and the Preventive Role of Selected Phytochemicals
Candidate: Ankita Das--- **PhD. Pursuing (Thesis submitted)**
Investigating the Histone Modifications Regulating Telomere Length in Chronically Arsenic Exposed Individuals
Candidate: Sunandini Ghosh--- **PhD. pursuing**
Investigating the Genetic-Epigenetic Interactions of Leptin-Melanocortin and Adiponectin-PPAR Pathways in Obesity
Candidate: Akash Dutta--- **PhD. pursuing**
Study of Anthropogenic Impact on the Behaviour of Hanuman Langur (*Semnopithecus entellus*) Residing in Different Habitats of South Bengal
Candidate: Indraneel Rakshit---**PhD. Pursuing**
Exploring Predictive Biomarkers and Therapeutic Potential of Natural Bioactive Compounds Against Arsenic-Induced Chronic Kidney Disease
Candidate: Sudeshna Mandal---**PhD. Pursuing**
Studies on Arsenic-Induced Renal Inflammation and Fibrosis: Molecular Mechanism And Potential Therapeutic Approach

Publications

Peer-reviewed Publications (students underlined) **ORCID ID https://orcid.org/0000-0002-4623-7746**

1. Dey A, Sanyal T, Bhattacharjee P, Sharma KD*, Bhattacharjee P (2024). *Nucleus (India)*, Integration of gene expression profiling and mathematical modelling to unravel significant biomarkers in population exposed to arsenic (accepted).

2. Dasgupta D, Banerjee A, Dutta A, Mitra S, Banerjee D, Karar R, Karmakar S, Bhattacharya A, Ghosh S, Bhattacharjee P, Paul M*. (2024). Gestures of Hunger: Uncovering intentional gestural communication in free-ranging Hanuman langurs. *Animal Cognition* (accepted on 16th December 2024).

3. Dhar S., & Bhattacharjee P* (2024). *Scientific Reports*. DOI: 10.1038/s41598-024-75719-0

4. Rakshit I, Mandal S, Pal S, Bhattacharjee P* (2024). *Nucleus (India)*, https://doi.org/10.1007/s13237-024-00494-2

5. Sanyal, T., Rakshit, I. &Bhattacharjee, P* (2024). *Environment, Development & Sustainability*https://doi.org/10.1007/s10668-024-04957-z

6. Ghosh S, Dhar S, Roy U, Mondal S, Bhattacharjee P* (2024). PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs-4018264/v1]

7. Dutta A, Dasgupta D, Banerjee A, Hasnain S.A., Sen D, Kuleri M.S., Bhattacharjee P, Paul M* (2024). *Animal Behaviour*. https://doi.org/10.1016/j.anbehav.2024.01.017

8. Dey A, Sharma K.D.*, Bhattacharjee P, Chatterjee A (2024). *Biomedical Signal Processing and Control*,90, 105860, ISSN 1746-8094, https://doi.org/10.1016/j.bspc.2023.105860

9. Sanyal T, Das A, Bhattacharjee S, Gump B.B., Bendinskas K, Bhattacharjee P* (2024). *Science of The Total Environment*. https://doi.org/10.1016/j.scitotenv.2023.169049

10. Sanyal, T., Ghosh, S., Giri, A.K. et al. (2023). *The Nucleus*. https://doi.org/10.1007/s13237-023-00440-8

11. Yadav A, Mukhopadhayay A, Chakrabarti A, Saha A,Bhattacharjee P* (2024). *Journal of Environmental Science and Public Health*. 8 (2024): 70-85

12. Yadav A, Mukhopadhayay A, Chakrabarti A, Saha A,Bhattacharjee P* (2023). *Journal of Environmental Science and Public Health*. 7 (2023): 185-199

13. Yadav A, Mukhopadhayay A, Chakrabarti A, Saha A,Bhattacharjee P*. *Indian Journal of Occupational and Environmental Medicine* (**Accepted**)

14. Yadav A, Mukhopadhayay A, Chakrabarti A, Saha A,Bhattacharjee P*. *Indian Journal of Environmental Protection* (**Accepted**)

15. Dhar S, Mondal KK, Bhattacharjee P* (2023). Scientific Reports. https://doi.org/10.1038/s41598-023-35858-2

16. Ghosh S, Paul M, Mondal KK, Bhattacharjee S, Bhattacharjee P.* (2023). *Scientific Reports*, DOI:10.1038/s41598-023-31977-y

17. Ghosh S[#], Dhar S[#], Bhattacharjee S, Bhattacharjee P.* (2023). *The Nucleus*. https://doi.org/10.1007/s13237-023-00420-y ([#]equal contribution)

18. Muthukumaran RB, Bhattacharjee P, Bhowmick P, Zote L, Malsawmtluangi M, Senthil Kumar N, et al. (2023). *Toxicology Reports*, DOI: 10.1016/j.toxrep.2023.02.001

19. Banerjee S, Dhar S, Sudarshan M, Chakraborty A, Bhattacharjee S, Bhattacharjee P.* (2022) *Journal of Trace Elements in Medicine and Biology*. DOI: 10.1016/j.jtemb.2022.127103

20. Das A, Sanyal T, Bhowmick P, Bhattacharjee P. (2022). *The Nucleus*. DOI: 10.1007/s13237-022-00392-5

21. Banerjee S, Dutta S, Dhar S, Bhattacharjee P.* (2022). *Journal of Scientific Research*, DOI: 10.37398/JSR.2022.660505

22. Dey A., Sharma KD., Sanyal T., Bhattacharjee P. Bhattacharjee P.* (2022). *IEEE Transactions on NanoBioscience*, 2022, doi: 10.1109/TNB.2022.3194091.

23. Basak, M., Sanyal, T., Kar, A., Bhattacharjee, P., Das, M., Chowdhury, S. (2022). Endocrine, **75** (447–455)

24. Dhar S, Mridha S and Bhattacharjee P. *Reprod. Sci.* **29,** 480–496 (2022).

25. Bhattacharya R, Chatterjee R, Mandal AKA, Mukhopadhyay A, Basu S, Giri AK, Chatterji U &Bhattacharjee P.* Nutrition and Cancer, 73:11-12, 2447-2459. 2021

26. Dasgupta D, Banerjee A, Karar R, Banerjee D, Mitra S, Sardar P, Karmakar S, Bhattacharya A, Ghosh S, Bhattacharjee P, Paul M*. Front. Psychol. https://doi.org/10.3389/fpsyg.2021.649027

27. Das A, Sanyal T, Bhattacharjee P, Bhattacharjee P*. EnvironRes.2021

28. Dhar S, Bhattacharjee P*.J FunctFoods.2021

29. Ghosh, K., Ghosh, S., Chatterjee, U., Bhattacharjee P., Ghosh A. Cell MolNeurobiol(2021)
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33. Sanyal, T., Paul, M., Bhattacharjee, S., Bhattacharjee, P*. Chemosphere2020;258
34. Banerjee S, Seal S, Dey R, Mondal K, Bhattacharjee P.*, J Med Virol 2021 93(3):1428-1435.
35. Bhowmik AD, Podder S, Mondal P, Shaw P, Bandyopadhyay A, Das A, Bhattacharjee P,Chakraborty A, Sudarshan M, Chattopadhyay. EcotoxicologyandEnvironmentalSafety,2020,110962
36. Banerjee S, Seal S, Dey R, Mondal K, Bhattacharjee P*, Identification of best suitablerepurposed drugs considering mutational spectra at RdRp (nsp12), 3CLpro (nsp 5) and Plpro(nsp3)ofSARS-CoV-2inIndianpopulation,2020. (Preprint)
37. Sanyal T, Bhattacharjee P, Paul S, Bhattacharjee P*. (2020) Frontiers in Public Health-Environmental Health, 8
38. Das A, Bhattacharjee P, Bhattacharjee P*. 2019, TheNucleus.1-9
39. Banerjee S, Dhar S, Bhattacharjee P*. InternationalJournalofScientific Research&Reviews(IJSRR),7:4(2018)1206-1218.(ISSN2279-0543).
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58. BhattacharjeeP, PaulS, BanerjeeM, PatraD,BanerjeeP,GhoshalN, BandyopadhyayA, Giri AK. SciRep.2013;3:2704.
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Note: ***corresponding author** (Ghosh P and Bhattacharjee P are the one and same person)

Book Chapters:

Book: Waste Water Treatment: 2022 | CRC Press
chapter entitled "**Recent Advancement and Combination of Different Molecular Tools and Techniques for Applications in Wastewater Treatment" by** Ritwija Bhattacharya, Indraneel Rakshit, Aniruddha Mukhopadhyay, **Pritha Bhattacharjee [https://doi.org/10.1201/9781003165057]**

Book: Development in Waste Water Treatment Research and Processes I 2022 I Elsevier
Chapter entitled: **Sewage sludge to biofuel: Emerging technologies for a sustainable environment**. By **Pritha Bhattacharjee,** Tanusree Sengupta, Krishnendu Ghosh
https://doi.org/10.1016/B978-0-323-85584-6.00005-4

Book: Effective Waste Management and Circular Economy I 2022 I CRC Press
Chapter entitled: **Study of Some Polymeric Coagulants Using Spent Tea Leaves as a Source of Natural Dye Supporting Circular Economy Concepts** by Ritwija Bhattacharya; Alokesh Mridha; Richa Sen; Aniruddha Mukhopadhyay; Debasish Das; **Pritha Bhattacharjee**
DOI: 10.1201/9781003231608-28

Book: New Trends in Removal of Heavy Metals from Industrial Wastewater I 2021 Elsevier
Chapter entitled: **Heavy metal removal using microbial bioremediation techniques**
By Shrinjana Dhar, Ankita Das, Pritha Bhattacharjee
DOI: 10.1016/b978-0-12-822965-1.00026-x

Bhowmick P, Lalrinjlupuii, Muthukumaran RB, **Bhattacharjee P*.** Food Diversity among Northeast Population: Resources of Nutraceuticals to Risk Factor for Disease Susceptibility, **2022.**

Sanyal T, Mondal K, Bhattacharjee P, Banerjee S, Ghosh S, Bhattacharya R, Bhattacharjee S and **Bhattacharjee P***. Chapter: Occupational and Environmental Health Hazards: Selected case studies from West Bengal, India. UGC-HRDC, **2017.** ISBN: 978-93-5268-753

Bhattacharjee P*, Banerjee S, Ghosh S, Chakraborty S and Kar A. Heavy Metals in Relevance to Human Health: Mechanism of Toxicity and Carcinogenicity. **2017.**

Paul S and Bhattacharjee P*. Arsenic: Exposure sources, Health Risks, and Mechanisms of Toxicity, First Edition. Chapter Contributed: Epigenetics and Arsenic Toxicity. John Wiley & Sons, Inc. 2015.

Banerjee M, **Bhattacharjee P**, Giri AK. Arsenic-induced Cancers: A review with special reference to gene, environment and their interaction. Genes and Environment. 2011.

Book Publication:

Published a book for Environmental Studies **(based onUGC approved under graduate syllabus)** named **"Paribesh Vidya"** from **Kalyani publication**.