With the understanding that "DNA is not the destiny", this lab focuses primarily on Epigenetics study from a varied perspective. Epigenetics plays a prime role in diseases susceptibility and differential manifestation, gene-environment interaction, behavioural adaptations and also in therapeutic interventions. Our lab currently focuses on the following research dimensions.

A. Epigenetic-genetic-environmental interaction-
   1. Epigenetic alterations (histone modifications, promoter methylation, miRNA regulation) in response to chronic arsenic exposure and carcinogenesis.

B. Nutri-epigenetics-
   Tea polyphenols and its role in cancer therapy: Epigenetic interplay in health and diseases.

C. Non-communicable lifestyle disorder: Environmental impact and role of epigenetics-
   1. Obesity and cardiovascular disease risk in urban-population.
   2. Endocrine disrupters and its effect on poly-cystic-ovarian syndrome.

D. Analysis of trace metals from biological samples and disease risk assessment by in-silico study-
   1. Study of trace elements from biological samples (blood, nail and hair samples) using PIXE.
   2. In-silico analysis of functionally altered genetic variants of target genes to predict disease risk.

E. Sustainable mitigation strategies for environmental and occupational health hazards-
   1. Socio-environmental challenges in waste hair reprocessing workers.
   2. Application of spent tea leaves for environmental waste management.

F. Behavioural epigenetics-
   To examine how life experiences of urban-adapted primates are transmuted into persistent changes in body function and behaviour in contrast to their wild brethren.
Lab members

Dr. Manabi Paul
DST-INSPIRE Faculty
Project: Behavioural adaptation in urban-adapted primates.

Dr. Pritha Bhattacharjee
Provisionally awarded
Project: Arsenic induced epigenetic alteration and carcino-genicity in human.

Krishnendu Ghosh
ICMR Research Fellow (Pre-thesis submitted)
Project: Human glioma biology and neuro-onco immunology.

Kousik Kumar Mondal
(Govt. approved part-time lecturer) Research Fellow (Pre-thesis submitted)
Project: Epidemiological and environmental consequences on occupational health.

Tamalika Sanyal
CSIR-UGC-SRF (Pre-thesis submitted)
Project: Altered mito-epigenetics in arsenic toxicity and carcinogenesis.

Ritwija Bhattacharya
UGC-UPE-JRF
Project: Role of black tea in cancer therapy and application of spent tea leaves in environmental waste management.
Ankita Das
CSIR-JRF
Project: Arsenic induced epigenetic deregulations and carcinogenesis in human.

Dishari Dasgupta
CSIR-LS (DST-INSPiRE) project JRF
Project: Cooperation-conflict dynamics in urban-adapted non-human primates.

Alakananda Biswas
CSIR-JRF
Project: Effect of environmental toxicants on epigenetic modifications.

Shuvam Banerjee
UGC-DAE-JRF
Project: Trace metal analysis in biological samples and in-silico study.

Sunandini Ghosh
UGC-UPE-JRF
Project: Obesity and its association with cardiovascular disease risk.

Shrinjana Dhar
UGC-LS research fellow
Project: Role of endocrine disrupters in metabolic disease.
## Research projects

<table>
<thead>
<tr>
<th>Title of Project</th>
<th>Funding Agency</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutritional and Environmental Hazards in Non-communicable diseases, obesity and cardiovascular risk</td>
<td>UGC-UPME</td>
<td>2017-2020</td>
</tr>
<tr>
<td>Comparative Study of Trace Elements in the Blood and Buccal Saliva of Arsenicosis and Cancer Patients using PIXIE &amp; Its Relation with DNA Damage Progression</td>
<td>UGC-DAE</td>
<td>2016-2019</td>
</tr>
<tr>
<td>Promising Role of Black Tea Polyphenols as Epigenetic Modulator: A New Bridge Between Nutrition and Health</td>
<td>NTRF</td>
<td>2015-2018</td>
</tr>
<tr>
<td>Cardiovascular Disease in Children Exposed to Arsenic, Lead and Mercury.</td>
<td>SUNY-OSWEGO, NY &amp; Syracuse University (International Collaboration)</td>
<td>2016-onwards</td>
</tr>
<tr>
<td>Genetic Variation in Multidrug Resistance Gene (MRP4) in Arsenic Exposed Population of West Bengal</td>
<td>University of Alberta, Canada (International Collaboration)</td>
<td>2016-2017</td>
</tr>
<tr>
<td>Role of Epigenetic Modifications in Arsenic-Induced Toxicity and Carcinogenicity: with special reference to Histone Modification</td>
<td>DST-Fast track</td>
<td>2013 – 2016</td>
</tr>
</tbody>
</table>

## Publications

**Research articles:**

1. Das A, Bhattacharjee P, **Bhattacharjee P***. 2019, Role of arsenic, lead and cadmium on telomere length and the risk of carcinogenesis: a mechanistic insight. The Nucleus.1-9
3. Sanyal T, Bhattacharjee P, Bhattacharjee S, **Bhattacharjee P***. 2018. Hypomethylation of mitochondrial D-loop and ND6 with increased mitochondrial DNA copy number in the arsenic-exposed population. Toxicology. 408: 54–61
5. Mondal K K, Sanyal T, Das S, Bhattacharjee S, **Bhattacharjee P***. Adverse health effects associated with increased cytogenetic damage and ERCC2 risk genotype in the occupationally exposed waste hair re-cycling workers from West Bengal, India. 2018. IJRAR, November 2018, Volume 5, Issue 4. (ISSN 2349-5138). doi:10.1729/Journal.18912


11 Das N, Giri A, Chakraborty S, Bhattacharjee P*. Association of single nucleotide polymorphism with arsenic-inducedskin lesions and genetic damage in exposed population of West Bengal, India. Mutation Research 2016;809:50–56


13 Chatterjee D, Bhattacharjee P, Sau TJ, Das JK, Sarma N, Bandyopadhyay AK, Roy SS, Giri AK. Arsenic exposure through drinking water leads to senescence and alteration of telomere length in humans: A case-control study in West Bengal, India. Mol Carcinog. 2015;54(9):800-9


*corresponding author (Ghosh P and Bhattacharjee P are the one and same person)
**Book Chapters:**


* corresponding author.

**Book Publication:**

1. Published a book for Environmental Studies (based on UGC approved under graduate syllabus) named “Paribesh Vidya” from Kalyani publication.

**Positions and memberships**

**Present Position**
Assistant Professor, Department of Environmental Science, University of Calcutta.

**Editorial Board Member (To list a few):**
Journal of Medical Genetics and Genomics (JMGG), Journal of Cancer Research and Experimental Oncology (JCREO), Updates in Nutritional Disorders and Therapy (2016). Elsevier Reviewer recognition for Environmental Research; Member, Asian Council of Science Editors.

**Reviewer (To list a few):**
Scientific Reports (Nature group), Environmental Research, Mutation Research, Journal of Genetics, Journal of Thoracic disease etc.

**Membership of Scientific Associations:**
All India Congress of Cytology and Genetics (AICCG), Indian Society of Human Genetics (ISHG), Indian Science Congress Association, India (ISCA), The Society of Biological Chemists, India (SBC), Environmental Mutagen Society of India (EMSI)
Mentorship

Awards received (under my supervision)

Best Poster:

- "Chronic Arsenic exposure and Cardiovascular Disease Risk in Arsenic-affected Population in West Bengal, India" by Ritwijja Bhattacharya, JRF, 22nd West Bengal State Science and Technology Congress, 2015.
- “Prospects of Black Tea in Cancer Therapy and Biosorption of Industrial Dye”by Ritwijja Bhattacharya, JRF, Seminar on Environmental science, emergence to Emancipation, 2018
- “Chronic Arsenic Toxicity and Mitochondrial Epigenome: A Case Control Study in West Bengal, India” by Tamalika Sanyal, SRF, Seminar on Environmental science, emergence to Emancipation, 2018.

Best paper presentation:

Best Oral Presentation:

Young Scientist Award:
“Low to High Grade Transformation: a Comparative study on Human CNS Tumours Hinting Disproportionate Molecular and Physiological Attributes” presented by Krishnendu Ghosh, JRF, International multidisciplinary research conference on biodiversity, climate change, physical and life sciences, Assam, 21-22 Jan, 2019.

Training Young Minds:
Total summer trainee: 19 (2013-2019) . From different Universities within or outside the state. Training helped them to qualify different National level exams and also acquiring PhD positions abroad.

Conferences attended

Foreign visit

- Participated in 2nd International conference on environmental health and global climate change, ICEG, 2017, September 7-8, Paris, France. Title of the Oral presentation was “Chronic Arsenic Exposure and Adverse Health Outcome: Understanding the Molecular Perspectives.”
- Visited in University of Manchester, UK for attending PRAMA (Probabilistic Risk Assessment for Ground Water Arsenic Mitigation in West Bengal, India) workshop and oral presentation "Arsenic in rice can induce significant genetic damage" in 2011.
Invited Lectures (2018-2019)
- Invited lecture at 2nd World clean Environment Summit at Science City, Kolkata, July, 2018.
- Invited lecture at National seminar on Environmental hazard and waste management, 28th August, 2018.
- Invited lecture at National seminar on Perspectives in emerging environmental issues: retrospect and prospect, 18th April, 2019.

Conferences attended (2017-2019):
- International symposium on "Translating Genes and Genomes" (AICCG), January 28th-31st, 2018, IICB, Kolkata.
- International Conference "IntZooCon", 1st - 3rd Feb, 2018, Ballygunge Science College, University of Calcutta, Kolkata.
- International Conference "Receyce 2018" 22-24th Feb, 2018, Guwahati, Assam.
- International Conference "Brain Tumor Meeting_2018: From Biology to Therapy" June 21-23, 2018, Warsaw, Poland.
- International Conference "Next Gen Genomics, Biology, Bioinformatics and Technologies Conference" 30th Sep-Oct 2nd, 2018, Jaipur
- International Conference on "NeuroScience_IAN 2018", Oct 29-31, BHU.
- Young Investigators Meet (YIM), 5-6th Feb, 2019, Presidency University, Kolkata.

Seminars (2018-2019)
- Acted as convenor for One day seminar on "Environmental Science: From Emergence to Emancipation", Dept. of Environmental Science, 2018, Ballygunge Sc. College.
- One day symposium on “Bridging Chemistry and Biology for Human Health and Disease”, organised by Society of Biological Chemists and CSIR-IICB, 21st September, 2019.