BORNALI BHATTACHARJEE, PhD

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Personal statement

My training and research interests lie at the interface of pathogen genomics, molecular microbiology, and evolutionary biology. I received my PhD in epidemiology & molecular virology from the Indian Statistical Institute & University of Calcutta under the mentorship of Sharmila Sengupta and post-doctoral training in viral Genomics and evolution from University of Massachusetts Medical School, Worcester under the mentorship of Timothy F. Kowalik. Following my training, I successfully obtained the "Ramanujan Fellowship" awarded by the Department of Science and Technology, Government of India. I currently hold a Research Associate Scientist position in Prof. Akiko Iwasaki's laboratory at Yale University and manage and scientifically contribute to post-acute sequelae SARS-CoV-2 infection (PASC) projects. My long-term goal is to develop genome-based "anticipatory" diagnostics of bacterial and viral infections that can help in the prescription of more resilient antimicrobial treatments.

Education

- **Ph.D** (2002–2008) in Epidemiology and Molecular Virology, Indian Statistical Institute & University of Calcutta, WB, India.
- **MSc** (2000-2002) in Biochemistry, University of Calcutta, WB, India.
- **BSc** (1997-2000) in Biochemistry, Northeastern Hill University, Meghalaya, India

Positions

2022-Present	Research Associate Scientist, Yale University, Connecticut, USA
2021-2022	Associate Professor, Amity University, West Bengal, India.
2015–2020	Ramanujan fellow, National Institute of Biomedical Genomics, West Bengal, India.
2014–2015	Senior Scientist, MedGenome Pvt. Ltd., Karnataka, India.
2009–2014	Postdoctoral fellow, University of Massachusetts Medical School. Timothy F. Kowalik, mentor.

Honors

2015–2020	Ramanujan Fellowship, Department of Science and Technology, Government of India

Invited Talks

National Seminar on Advancement of Biology in the 21st Century. 2020, 28th-29th February Viswa Bharati University, India.

India-EMBO Symposium Human microbiome: Resistance and disease. 9th –12th November 2019, India.

Publications

1. Chakraborty M., Bardhan T., Basu M., **Bhattacharjee B**. 2022. Influence of Sub-Inhibitory Dosage of Cefotaxime on Multidrug Resistant *Staphylococcus haemolyticus* Isolated from Sick Neonatal Care Unit. Antibiotics (Basel) 11 (3), 360. PMID: 35326823
2. Mandal P., **Bhattacharjee B.***, Sen S., Bhattacharya A., Sharma Saha S., Roy Chowdhury R., Ranjan Mondal N., Chakrabarty B., Chatterjee T., Roy S., Sengupta* S. 2022. Predominance of genomically defined A lineage of HPV16 over D lineage in Indian patients from eastern India with squamous cell carcinoma of the cervix in association with distinct oncogenic phenotypes. Translational Oncology. 15(1): 101256
3. Pandit B., Bhattacharjee S., **Bhattacharjee B**. 2021. Association of clade-G SARS-CoV-2 viruses and age with increased mortality rates across 57 countries and India. Infection, Genetics and Evolution. 90:104734. PMC7839510
4. Bardhan T., Chakraborty M., **Bhattacharjee B.** 2020. Prevalence of Colistin Resistant, Carbapenem-hydrolyzing Proteobacteria in Hospital Water bodies and Out-falls of West Bengal, India. International Journal of Environmental. Research and Public Health 17 (3): 1007. PMC7037630
5. Bardhan T., Chakraborty M., **Bhattacharjee B.** 2019. Bactericidal activity of Lactic acid against clinical, carbapenem-hydrolyzing, multi-drug resistant *Klebsiella pneumoniae* planktonic and biofilm-forming cells. Antibiotics (Basel) 8(4): E181. PMC6963607
6. **Bhattacharjee B.***, Bardhan T., Chakraborty M. and Basu M. 2019. Resistance profiles and resistome mapping of multidrug resistant carbapenem-hydrolyzing *Klebsiella pneumoniae* strains isolated from the nares of preterm neonates. 2019. International Journal of Antimicrobial Agents 53(4):535-37. PMID: 30572009
7. Mandal, P., **Bhattacharjee B.***, Sen, S., Bhattacharya A., Roy Chowdhury, R., Mondal, N. R., and Sengupta, S.* 2016. Complete genome sequences of eight Human Papillomavirus type 16 Asian American and European variant isolates from cervical biopsies and lesions in Indian women. Microbiology Resource Announcements 4(3) e00243-16. PMC4878291
8. Renzette, N., Pokalyuk, C., Gibson, L., **Bhattacharjee, B.**, Schleiss, M. R., Hamprecht, K.,Yamamoto, A. Y. Mussi-Pinhata, M. M., Britt, W. J., Jensen, J. D., Kowalik, T.F. 2015. Limits and patterns of cytomegalovirus genomic diversity in humans. Proc Natl Acad Sci U S A 112 (30) E4120-E4128. PMC4522815
9. Gupta, R., Ghosh, S., Monks, B., DeOliveira, R., Tzeng, T., Kalantari, P., Nandy, A., **Bhattacharjee, B.**, Chan, J., Ferreira, F., Rathinam, V., Sharma, S., Lien, E., Silverman, N., Fitzgerald, K., Firon, A., Trieu-Cuot, P., Henneke, P., Golenbock, D. 2014. RNA and β-hemolysin of Group B streptococcus induce IL-1β by activating NLRP3. inflammasomes in mouse macrophages. J Biol. Chem. 289(20): 13701-5. PMC4022842
10. Renzette, N., Gibson, L., **Bhattacharjee, B.**, Fisher, D., Schleiss, M.R., Jenson, J.D. and Kowalik, T.F. 2013. Rapid Intrahost Evolution of Human Cytomegalovirus is Shaped by Demography and Positive Selection. PLoS Genetics 9(9):e1003735. PMC3784496

11. Mandal, P., **Bhattacharjee, B.**, Das Ghosh, D., Mondal, N.R., Roy Chowdhury, R., Roy, S., Sengupta, S. 2013. Differential Expression of HPV16 L2 Gene in Cervical Cancers Harboring Episomal HPV16 Genomes: Influence of Synonymous and Non-Coding Region Variations. PLoS ONE 8(6):e65647. PMC3675152
12. **Bhattacharjee, B.**, Renzette, N., Kowalik, T.F. 2012. Genetic analysis of cytomegalovirus in malignant gliomas. J. Virology 12: 6815-24. PMC3393585
13. Das Ghosh, D.[#], **Bhattacharjee, B.**[#], Sen, S., Premi, L., Mukhopadhyay, I., Chowdhury, R., Roy, S., Sengupta, S. 2012. Some Novel Insights on HPV16 Related Cervical Cancer Pathogenesis Based on Analyses of LCR Methylation, Viral Load, E7 and E2/E4 Expressions. PLoS ONE 7(9): e44678. PMC3435323
14. Renzette, N., **Bhattacharjee, B.**, Jensen, J.D., Gibson, L., Kowalik, T.F. 2011. Extensive genome-wide variability of human cytomegalovirus in congenitally infected infants. PLoS Pathogens 7(5):e1001344. PMC3098220
15. Das, D., **Bhattacharjee, B.**, Sen, S., Mukhopadhyay, I., Sengupta, S. 2010. Association of viral load with HPV16 positive cervical cancer pathogenesis: causal relevance in isolates harboring intact viral E2 gene. Virology 402(1):197-202. PMID: 20394955
16. **Bhattacharjee, B.**, Mandal, N.R., Roy, S., Sengupta, S. 2008. Characterization of sequence variations within HPV16 isolates among Indian women: prediction of causal role of rare non-synonymous variations within intact isolates in cervical cancer pathogenesis. Virology 377(1):143-50. PMID: 18495198
17. **Bhattacharjee, B**., Sengupta, S. 2006. CpG methylation of HPV 16 LCR at E2 binding site proximal to P97 is associated with cervical cancer in presence of intact E2. Virology 354(2):280-5. PMID: 16905170
18. **Bhattacharjee, B.**, Sengupta, S. 2006. HPV16 E2 gene disruption and polymorphisms of E2 and LCR: some significant associations with cervical cancer in Indian women. Gynecologic Oncology 100(2):372-8. PMID: 16246404

Technical Expertise

- Next generation sequencing of genomes and genome assembly of bacteria and viruses isolated from patient specimens and cell-culture using Bowtie2 and Velvet.
- Performing Annotation of new bacterial using RAST annotation server, NCBI Prokaryotic Genome Annotation Pipeline (PGAP) and the Antimicrobial Resistance Database (ARDB) and viral genomes using Genome Annotation Transfer Utility (GATU).
- Microbiome amplicon sequence analyses using Mothur suite.
- Identifying whole genome selection hotspots using *SweepFinder* and the role of demography in shaping viral populations using *dadi*.
- NCBI genome submission using BankIt.
- Patient cohort setup for longitudinal studies.
- Patient specimen handling and isolation of pathogenic bacteria and characterization of resistance patterns using standard Kirby-Bauer assays and broth dilution assays.
- Performing statistical analyses using SPSS, Graphpad Prism and phylogenetic analyses using NETWORK, Geneious suite and MEGA5
- Propagating herpesviruses
- Transduction of genes with recombinant adenovirus vectors and transfection of bacterial artificial chromosomes (BACs).
- SDS-PAGE, western blot, quantitative RT-PCR on patient specimens and cultured cells.
- Performing neutralization assays

Completed Support

07/10/2015-07/09/2020
Ramanujan Fellowship Grant, Department of Science and Technology, Government of India
Bornali Bhattacharjee (PI)
Understanding the influence of exposure to nosocomial pathogens and antibiotic usage among neonates in determining infant nasal microbial colonization in preterm infants and infants born at term.

2019-2020
Intramural Funding from National Institute of Biomedical Genomics, West Bengal, India.
Bornali Bhattacharjee (PI)
Role of cervicovaginal dysbiosis in HPV persistence, immune modulation and adverse outcomes.