ICMR-NIRBI

ACHIEVEMENT & ACTIVITY REPORT

2024-25

आई.सी.एम.आर-राष्ट्रिय जीवाणु संक्रमण अनुसंधान संस्थान

ICMR-National Institute for Research in Bacterial Infections

स्वास्थ्य अनुसंधान विभाग / Department of Health Research

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भारत सरकार / Government of India

WHO Collaborating Centre for Research and Training on Diarrhoeal Diseases

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2024-25

ICMR INDIAN COUNCIL OF MEDICAL RESEARCH | NIRBI NATIONAL INSTITUTE FOR RESEARCH IN BACTERIAL INFECTIONS

The Achievement & Activity Report was compiled by the following editorial team

Dr. Santasabuj Das, Director & Scientist G	Chairperson
Dr. Alok Kr. Deb, Scientist G	Member
Dr. Sulagna Basu, Scientist G	Member
Dr. Debjit Chakrabarty, Scientist E	Member
Mrs. Saheli Samanta, Sr. Technical Officer	Member

The scientific content of this report belong to the individual scientist and does not reflect the view of the editorial team.

From the Direcotor's Desk

It is a matter of immense pride for me to present the Achievement and Activity Report, 2024-25 of ICMR-NIRBI. It is the testimony of a remarkable time as we evolve into an institute of great national importance, dedicated to cutting edge research on bacterial infections and antimicrobial resistance. I am extremely glad that we successfully pursued the rich legacy of ICMR-NICED during this transition and continued to make important scientific contributions that will help policy decisions to protect and improve public health. This year marked significant scientific achievements and institutional growth, enabling us to lead the charge in better understanding of infectious diseases and more accurate diagnosis and mitigation of their impact in India.

Our hospital-based surveillance data on enteric bacterial pathogens continued to provide critical inputs to public health measures. Genomic data of *shigella* spp collected over a decade (2009-2019) showed an alarming rise in multidrug resistance. Foodborne pathogen surveillance in the north-eastern states identified novel *Salmonella enterica* serovars and their high level of resistance to azithromycin, in addition to wide distribution of resistance determinants (*blaOXA* variants and *gyrA* mutations) in *Campylobacter* spp. Documentation of mother to child transmission of carbapenem resistant *Klebsiella pneumoniae* warrants gut screening to monitor the spread. These high-resolution data are critical for monitoring antimicrobial resistance (AMR) trends and guiding national treatment strategies. Several important discoveries on bacterial pathogenesis were made. A novel mechanism of phagosomal survival of *Salmonella* Typhi inside human macrophages, promoted by a bacterial serine/threonine kinase was demonstrated. Development and pathogenic role of a membrane-less isoform (L-form) of *Salmonella* Typhi that leads to antibiotic treatment failures due to increased antibiotic tolerance was also described. An important discovery described the role of RNA-binding protein AUF-1 in dietary fibre-mediated protection from inflammatory bowel disease by the generation of IL-10 producing B cells.

This year, we successfully developed a Loop-mediated Isothermal Amplification (LAMP) assay for rapid and more sensitive diagnosis of *Vibrio cholerae* O1 directly from the stool samples. Similarly, a Rapid LAMP-based Diagnostic Test (RLDT) for *Shigella* and ETEC showed near-perfect concordance with qPCR, offering a lifeline for resource-limited settings. A novel multiplex qPCR assay for the detection of common enteric parasites including *Cryptosporidium* spp fulfilled a long-standing demand.

Significant contributions were also made towards development of novel drug and vaccine candidates. Andrographolide (ADG) was identified as an active antiparasitic compound in the extracts from indigenous herb *Andrographis paniculate*. Ursolic acid showed cytotoxic effect against *Entamoeba*, while sodium butyrate reduced fluid loss in the animal model *Vibrio cholerae* by suppressing critical virulence genes, tcpA and ctxAB expression. In

the vaccinology domain, a novel glycoconjugate vaccine, simultaneously protective against *Salmonella* Typhi and *Salmonella* Paratyphi was developed and an Indian patent application was filed. A next generation candidate vaccine for *Helicobacter pylori* was based on sodium alginate encapsulated and green-synthesized, titanium nanoparticle-coated OMV (SGTiOMVs).

The institute carried forward its legacy of high-quality vaccine clinical trials to contribute to national policy decisions. Impact assessment of a killed, oral cholera vaccine administration through the public healthcare system in rural West Bengal is expected to add valuable inputs to the National Plan for Cholera Control. The effectiveness trial of a combined flu and pneumococcal vaccine in reducing elderly hospitalization and mortality will also be critical for national policy decisions.

Climate impact on health has become a global concern. ICMR-NIRBI studied climate impact on HIV co-morbidity, care, treatment indicators and socio-behavioural attributes impacting HIV response. A United Nation Development Program (UNDP)-funded project developed a broad framework to identify research priorities for mitigating the impact of climate change on HIV response in India.

As in the past, public health remained a major focus area. Our research explored the scope of implementing tier-specific antimicrobial stewardship program (AMSP) to improve rational antibiotic usage.

ICMR-NIRBI has played a leading role in several, nationwide health networks. The regional VRDL laboratory of the institute actively collaborated with the public health facilities of West Bengal and Sikkim to provide diagnostic, training and research support on 30 viral pathogens. As a Regional Reference Laboratory, we provided critical support to the National AIDS Control Programme (NACP) by processing thousands of samples for Early Infant Diagnosis (EID) and viral load testing. The Vibrio Phage Reference Laboratory and the National Repository of Antimicrobial Resistant Bacteria continued to provide valuable service to the nation. NIRBI had also been an integral part of the District Level Sentinel Surveillance (DLSS) for Tuberculosis burden in India, 2023-20.

The intellectual capital of the Institute continued to grow through the mentoring of Ph.D. students and postdocs and the filing of patent applications. Participation at the national and international conferences helped to foster collaborations to bridge the gap between indigenous bioresources and global AMR challenges. NIRBI takes the pledge for continued prioritization of translational research to transform laboratory insights into bedside solutions. I extend my deepest gratitude to our scientists, students and fellows, administrative staff, project employees and collaborating partners for their tireless efforts that are reflected in the pages of this document. Together, we are building a more resilient and healthier nation.

Dr Shantasabuj Das
Director & Scientist G, ICMR-NIRBI

CONTENTS

R. K. Nandy (Principal Investigator), Bacteriology Division

Culture-independent rapid detection of *Vibrio cholerae* O1 from clinical specimens.

- A Loop-mediated isothermal amplification (LAMP) assay for detecting *V. cholerae* O1 has been developed.
- The assay was *V. cholerae* O1 specific and remained negative against *V. cholerae* clinical strains belonging to O139 and non-O1, non-O139 serogroups.
- Clinical strains of *Shigella* spp., *Salmonella* spp., *E. coli* and *Klebsiella* spp. did not show any positive reactions.
- Rapid extraction of total DNA from pre-treated diarrheal stools has been developed, which is suited for the LAMP assay.
- Spiked *V. cholerae* O1 strains in the diarrheal stools showed the limit of detecting a single cell equivalent in the spiked samples using the newly developed LAMP assay.
- Diarrheal stools collected from hospitalized patients were microbiologically analyzed to identify clinical cholera by detecting *V. cholerae* O1. A subset of the same specimens was analyzed using the LAMP assay, and the data were compared with the culture-based detection.
- A comparative analysis showed that all culture-confirmed cholera cases (n=17) were positive in the LAMP assay. In addition, LAMP assay-based positivity was noted for nine specimens, which were negative in culture. Five of these nine specimens gave ctxA PCR positivity, a unique marker for cholera-causing *V. cholerae* strains. Therefore, due to a higher detection efficiency, the LAMP assay identified additional specimens with cholera that a conventional culture-based assay would have missed.
- The LAMP assay's detection efficiency is higher than conventional PCR; therefore, it has been planned to include more clinical specimens, perform real-time PCR, and compare data with the newly developed LAMP assay to assess sensitivity and specificity, with RT-PCR data serving as the gold standard.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- Participated in a National Conference on 'Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR)' organized by ICMR-NIRBI in collaboration with SFE during the period April 4, 2025.
- Joined as Trainee upon nomination by the Director, ICMR-NIRBI in a 'Training and Operational Exercises enhance current knowledge/ skills levels in cyber defensive operations and Operational Technology' organized by The National Critical Information Infrastructure Protection Centre during April 5-14, 2025.
- Participated in 'DBT-ICMR-IAVI AMR Workshop' organized by ICMR during May 3, 2024.
- Participated in a webinar "On the Road to Excellence," by the Bureau of Indian Standards (BIS) during July 10, 2024.
- As a member joined 'Technical Committee Meeting of Drinking Water and Carbonated Beverages Sectional Committee, FAD 14' organized by Bureau of Indian Standard (Online) on July 31, 2024.
- Participated in a webinar on 'Prevention of Sexual Harassment (POSH) at Workplace' organized by ICMR during December 10, 2024.

A. K. Mukhopadhyay (Principal Investigator), Bacteriology Division

Point-of-Care Diagnosis: Evaluation of RLDT Performance for *Shigella* and ETEC Detection Among Indian Pediatric Cases

Current diagnostic assays for *Shigella* spp. and enterotoxigenic *Escherichia coli* (ETEC) are often complex, limiting their use in resource-poor, high-burden regions. To address this, we evaluated a simple nucleic acid amplification method—the Rapid LAMP-based Diagnostic Test (RLDT)—for detecting these pathogens and assessing their prevalence in Kolkata, India. Stool samples (n = 405) from children under five years with diarrhea were tested. RLDT detected *Shigella* in 85 (21%) and ETEC in 68 (17%) cases, while quantitative PCR (qPCR) identified 91 (23%) and 58 (14%), and culture detected only 35 (9%) and 15 (4%), respectively. RLDT demonstrated near-perfect concordance with qPCR (Kappa 0.96 for *Shigella*, 0.89 for ETEC). Sensitivity was 93% and 98%, with specificity of 100% and 97% for *Shigella* and ETEC, respectively. Compared to culture, RLDT identified 12% more *Shigella* and 13% more ETEC cases. Importantly, all but one culture-positive sample for each pathogen were also RLDT-positive, yielding sensitivities of 97% and 93%, respectively. These findings highlight RLDT as a rapid, sensitive, and highly reliable tool for pathogen detection. Its simplicity and minimal training requirements make it well-suited for implementation in endemic, resource-limited settings. RLDT could substantially strengthen routine disease surveillance and enable timely outbreak detection, offering significant public health value.

“Hidden Dangers on the Menu: A Study of Foodborne Pathogens in Northeast India”

The presence of *Salmonella* in food is a major public health concern, as contaminated products can introduce the pathogen into the human food chain. *Salmonella enterica* is highly diverse, comprising ~2,600 serovars, and non-typhoidal *Salmonella* (NTS) poses particular challenges due to multiple sources and virulence factors. While NTS gastroenteritis is often self-limiting, its invasive potential poses serious health risks. Since 2020, the Indian Council of Medical Research (ICMR) has undertaken systematic laboratory-based surveillance of foodborne enteric diseases and outbreaks in four North-eastern states. As part of this effort, 1,004 food samples were screened from 36 sites across four regions of Tripura. Importantly, this period had no flux of foreign travelers, ensuring local origin of isolates. The study identified three *S. enterica* serovars—Takoradi, Tananarive, and Uganda—previously unreported from India. These were isolated from market samples of mutton, sweets, and fish, respectively. All exhibited resistance to tetracycline and reduced susceptibility to azithromycin. The latter finding is of concern, as azithromycin is commonly used for treating enteric infections in India. The detection of novel serovars with antimicrobial resistance underscores the potential risks of emerging *Salmonella* threats in the food chain. These findings highlight the urgent need for sustained surveillance, robust food safety monitoring, and control measures across production and distribution to mitigate public health risks.

Genomic Insights into *Campylobacter*: Unraveling Clinical Strain Diversity in West Bengal, India

Campylobacter species are among the most common global causes of foodborne gastroenteritis. India, with its high burden of diarrheal diseases, also experiences frequent *Campylobacter* infections, but genomic insights remain limited. This study analyzed 112 *Campylobacter* isolates from diarrhea patients at two hospitals in Kolkata, West Bengal, using whole genome sequencing. The collection comprised 90 *C. jejuni*, 20 *C. coli*, and 2 *C. lari* isolates. Multilocus sequence typing (MLST) showed that the dominant sequence types (STs) were ST-2131 in *C. jejuni* and ST-830 in *C. coli*, with seven novel STs in *C. jejuni* and one in *C. coli*. Of note, ST-2131, rarely reported elsewhere, carried a sialylated LOS-associated gene cluster (*wlaN* + *neuA* + *cstIII*) linked to Guillain-Barre Syndrome.

Genomic prediction of antimicrobial resistance revealed widespread resistance determinants: *blaOXA* variants (58.9%), *tet(O)* (54.5%), *tet(W)* (0.9%), *ant(6)-Ia* (0.9%), mutations in *gyrA* (79.5%), and mutations in 23S rRNA (A2075G, 12.5%). These findings demonstrate both high resistance rates and circulation of *Campylobacter* strains with potential neurological disease associations. This study emphasizes the value of genomic surveillance in understanding the diversity, virulence, and resistance mechanisms of *Campylobacter*. Genomic data generated here provide crucial insights to strengthen monitoring and guide strategies for controlling this important foodborne pathogen in India.

"A Decade of Resistance: Prevalence and Evolving Antimicrobial Patterns of *Shigella* spp. in Kolkata" (2011–2019)"

This study investigated the occurrence, characteristics, and antimicrobial resistance of *Shigella* serogroups isolated from acute diarrhea patients at the Infectious Diseases Hospital, Kolkata, between 2011 and 2019. *Shigella* isolates were analyzed for serogroup distribution, resistance patterns, virulence genes, and clonal diversity. Overall, 5.8% of *Shigella* spp. were recovered, with *S. flexneri* (76.1%) as the predominant serogroup, followed by *S. sonnei* (18.7%), *S. boydii* (3.4%), and *S. dysenteriae* (1.8%). High resistance to nalidixic acid was observed across nearly all isolates, while resistance to β-lactamases, fluoroquinolones, tetracycline, and chloramphenicol varied. Multidrug resistance was strongly associated with drug-resistance genes, topoisomerase mutations, and mobile genetic elements. Notably, all isolates carried the *ipaH* virulence gene. Dendrogram analysis of plasmid profiles and PFGE patterns revealed 70–80% clonal similarity within each serotype, indicating both genetic diversity and persistence of resistant clones in circulation. This long-term surveillance underscores a serious rise in multidrug-resistant *Shigella* strains in Kolkata, posing a growing challenge to current treatment regimens. The findings not only provide valuable insights into the evolving antimicrobial resistance trends but also emphasize the urgent need for updated, region-specific treatment guidelines and stronger monitoring strategies to control the spread of resistant *Shigella* in India.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- Participated in the 60th Anniversary Ceremony and the 25th International Conference on Emerging Infectious Diseases (EID) in the Pacific Rim, organized by the USJCMSP, held in Tokyo, Japan, from March 11–15, 2025. During the conference, Dr. Mukhopadhyay delivered an oral presentation titled "Emergence of Carbapenem Resistance in Clinical *Vibrio cholerae* O1 Strains: A Threat to Public Health," highlighting a critical concern for global health.
- Attended the Antimicrobial Resistance Conference on "Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR)" organized by the ICMR- NIRBI (Kolkata) and DBT-IBSD (Imphal) held in Kolkata, India from April 4-5, 2025 and presented his research on antimicrobial resistance.

Patent(s) filed/accepted /technology developed

Patent title: "A novel formulation of Sodium Alginate encapsulated green-synthesized Titanium Nanoparticle coated OMVs based vaccine (SGTiOMVs) against prevalent strains of *Helicobacter pylori*" (Co-inventor)
Patent application number: 202411029436.
Patent Filling date: April 11, 2024. Patent applied through ICMR patent Cell

Post and Pre-Doctoral Fellows:

Post-Doctoral Fellows:
Dr. Gautam Chowdhury, Project Scientist D
Dr. Pinaki Biswas, Project Scientist B
Dr. Bipul Karmakar, Project Research Scientist I (Non-medical)

Pre-Doctoral Fellows:
Ms. Puja Bose, Project Technical Support III
Ms. Deboleena Roy, SRF-UGC
Mr. Nirupam Roy, SRF-UGC
Mr. Debajit Mishra, SRF-CSIR
Mr. Arnab Kar, JRF-ICMR
Mr. Tapu Barman, Technical Officer-AcSIR

S. Basu (Principal Investigator), Bacteriology Division

Transmission of carbapenemase-producing Enterobacterales from mother to neonate

New Delhi metallo-β-lactamase (NDM), is endemic in India, and the gut may act as a reservoir of carbapenemase-producing Enterobacterales (CPE). This study assessed the transmission of CPE from pregnant mothers to neonates. Eight mother-neonate pairs were found to harbor similar carbapenem-resistant species, predominantly *Escherichia coli* and *Klebsiella pneumoniae*. PFGE and genomic analysis depicted only one case of vertical transmission [$bla_{NDM\text{-}1}$+ve-*K. pneumoniae*; sequence type (ST) 147] from mother to a neonate. Isolates belonged to diverse STs, including epidemic clones (ST11/15/147/405, and 410). bla_{NDM}-variants ($bla_{NDM\text{-}1,5,7}$) were detected, $bla_{NDM\text{-}5}$ predominant in *E. coli* while $bla_{NDM\text{-}1}$ in *K. pneumoniae* and was predominantly associated with conjugative IncFII and IncFII(K) replicons. Though only a single case of mother-to-baby transmission has been noted yet, screening of the gut is important to monitor CPE spread in hospital settings and beyond.

Co-existence of plasmid-mediated $bla_{NDM\text{-}1}$ and $bla_{NDM\text{-}5}$ in *Escherichia coli* sequence type 167and ST101

The concurrent presence of multiple New Delhi metallo-β-lactamase (bla_{NDM}) variants within an isolate is rare and often goes undetected. This study detects and characterizes dual bla_{NDM} variants ($bla_{NDM\text{-}1}$ and $bla_{NDM\text{-}5}$) through Sanger and whole-genome sequencing in *E. coli* epidemic clones ST167 and ST101 isolated from maternal rectal swab and neonatal blood specimens (not paired). Sanger sequences of bla_{NDM} showed two peaks at nucleotide positions of 262 (G and T) and 460 (A and C), indicative of more than one bla_{NDM} variant. Hybrid genome assembly confirmed that both isolates exhibited two different bla_{NDM} variants: $bla_{NDM\text{-}1}$ was found on IncY (ST167) and IncHI1A/HI1B (ST101), while blaNDM-5 was detected on IncFIA/FII (ST167) and IncC (ST101) plasmids. In addition, a simple restriction digestion method was developed to screen dual bla_{NDM} variants rapidly.

Diversity of mobile genetic elements in carbapenemase-producing Enterobacterales from ICUs in Northeast India

This study highlights the prevalence of multidrug-resistant *E. coli* and *K. pneumoniae*, notably epidemic clones (*K. pneumoniae*-ST16/101/147/231 and *E. coli*-ST167/410/648) in different ICUs from a tertiary care hospital of Tripura (Northeast India). Three types of carbapenemases (bla_{NDM}, $bla_{OXA\text{-}182,232}$ and $bla_{KPC\text{-}2}$) were detected. The dominant carbapenemase was bla_{NDM}, particularly $bla_{NDM\text{-}5}$, indicating a shift from $bla_{NDM\text{-}1}$, consistent with global trends. Three variants of bla_{NDM} ($bla_{NDM\text{-}1/5/7}$) were located on conjugative plasmids (mainly IncF-types), while $bla_{OXA\text{-}181/232}$ were on non-conjugative plasmids (ColKP3). Distinct mobile genetic elements (MGEs) such as IS*Aba125* (in Tn*125*), IS*3000*, IS*Kpn6/7* (in Tn*4401b*), and ΔIS*Ecp1* (in Tn*2013*) were associated with $bla_{NDM\text{-}1,5}$, $bla_{NDM\text{-}7}$, $bla_{KPC\text{-}2}$ and $bla_{OXA\text{-}181,232}$ respectively, reflecting globally recognized genetic contexts. The isolates were closely related to other Indian strains, mainly from blood, and the shared MGEs suggest inclusion in a global resistance gene pool, underscoring the risk of widespread carbapenem resistance and associated treatment failures.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- International Conference on Advances in Medical Biotechnology (ICAMB2025), in Kolkata on January 20, 2025 at 2:30 PM as an Invited Speaker. Department of Biotechnology, Heritage Institute of Technology, Kolkata, India.

- AMR Research conference, National Centre for Biological Sciences campus, Bengaluru, India,from August 22nd-23rd, 2024. Tata Institute for Genetics & Society at Dasheri auditorium.
- One-day workshop on "Novel Intervention approaches to combat AMR" under the existing ICMR-DBT-IAVI MoU. At the India Habitat Centre, Lodhi Road, New Delhi, on May 3rd, 2024.
- National conference on "Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR)" on April 4-5, 2024 at Science City Auditorium, Kolkata, ICMR-NIRBI, invited speaker "Mobile genes in the maternal and neonatal gut: the mcr story".
- National conference on "Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR)" on April 4-5, 2024 at Science City Auditorium, Kolkata. Emerging ST985, K39 carbapenem-resistant hypervirulent *Klebsiella pneumoniae* (CR-hvKp): A deviation from conventional hvKp. (Scientific poster presented by Deblina Nath).
- National conference on "Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR)" on April 4-5, 2024 at Science City Auditorium, Kolkata. 'Understanding the transmission of NDM-harboring plasmids in the gut of pregnant mothers'. (Oral presentation by Priyanka Basak).
- National conference on "Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR)" on April 4-5, 2024 at Science City Auditorium, Kolkata. New Delhi metallo-β-lactamase (NDM)-harbouring epidemic clone ST410 of *Escherichia coli* causing neonatal sepsis: antibiotic resistance and virulence over a decade. (Scientific poster presented by Amrita Bhattacharjee).
- National conference on "Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR)" on April 4-5, 2024 at Science City Auditorium, Kolkata. Novel sequence type of carbapenem- and colistin-resistant *Acinetobacter baumannii* ST2339. (Scientific poster presented by Tanusree Das).
- National conference on "Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR)" on April 4-5, 2024 at Science City Auditorium, Kolkata. 'Phylogeny, resistome and mobile genetic elements of emerging Oxacillinase-48-like carbapenemases: snapshot from a neonatal unit'. (Oral presentation by Dr. Sharmi Naha).
- National conference on "Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR)" on April 4-5, 2024 at Science City Auditorium, Kolkata. 'Presence of CRISPR-Cas system in *Klebsiella pneumoniae* and its association with multidrug resistance (MDR)'. (Scientific poster presented by Ankur Rao).

Post and Pre-Doctoral Fellows:

Post-Doctoral Fellow
Dr. Tanusree Ray, Project Research Scientist-II (Non-medical)
Dr. Sharmi Naha, Project ResearchScientist-II (Non-medical)

Pre-Doctoral Fellow
Ms. Amrita Bhattacharjee, Project Research Scientist-I (Non-medical)
Ms. Priyanka Basak, SRF-ICMR
Mr. Ankur Rao, SRF-ICMR
Ms. Tanusree Das, SRF-UGC
Ms. Deblina Nath, SRF-UGC
Mr. Sanjib Das, JRF-UGC
Mr. Subhodip Chakraborty, JRF-DBT

H. Koley (Principal Investigator), Bacteriology Division

Development of a vaccine against *Helicobacter pylori* based on immunogen formulated from circulating prevalent strains

This study presents the development and characterization of a novel vaccine formulation targeting *Helicobacter pylori*, utilizing sodium alginate-encapsulated, green-synthesized titanium nanoparticle (Ti-NP)-coated outer membrane vesicles (OMVs). Twelve *H. pylori* strains were screened for key virulence genes—*cagA*, *vacA*, *babA2*, and *dupA*. Strain A61C(1), positive for all four markers, was selected for immunogen preparation due to its high virulence. OMVs from A61C(1) were isolated and characterized using dynamic light scattering (DLS), transmission electron microscopy (TEM), and LC/MS proteomic analysis. These OMVs averaged 50 nm in diameter and contained immunogenic proteins such as UreA, UreB, and GroEL.

Green-synthesized Ti-NPs were produced using *Centella asiatica* extract, confirmed by TEM and SAED analyses. Coating OMVs with Ti-NPs preserved vesicle integrity and resulted in well-dispersed, stable composites. Encapsulation of Ti-NP-coated OMVs with sodium alginate formed a structured scaffold, producing the final SGTiOMV formulation. TEM analysis showed consistent nanoparticle size (~21 nm) and OMV diameter (~124 nm), confirming successful fabrication.

Cytotoxicity assays revealed significantly lower toxicity of both naïve OMVs and SGTiOMVs compared to LPS-positive controls (**$p < 0.01$), underscoring their biocompatibility. The structural integrity and safety of the formulation suggest its suitability for biomedical use.

In conclusion, this green nanotechnology-based approach offers a stable, non-toxic, and potentially effective oral vaccine against *H. pylori*. With improved antigen delivery and immunogenicity, SGTiOMVs provide a sustainable alternative to current treatments. Future research should focus on large-scale production and clinical trials to validate its therapeutic potential.

Patent(s) filed/accepted /Technology developed

A Novel Formulation of Sodium Alginate Encapsulated Green-Synthesized Titanium Nanoparticle Coated OMVs based vaccine (SGTiOMVs) against prevalent strains of *Helicobacter pylori*.
Patent Application No.: 202411029436
Date : 11.04.2024

PhD Awarded:

Name: Dr. Prolay Halder
Title of the Thesis: Immunogenicity and efficacy studies of typhoidal *Salmonella* immunogen in animal model
University: Jadavpur University
Date of award: 28.08.2024.

Name: Dr. Soumalya Banerjee,
Title of the Thesis: “Preparation of immunogen from prevalent strains of diarrheagenic *Escherichia coli* and evaluation of its protective efficacy in animal model to reduce diarrheagenic *Escherichia coli* mediated clinical health burden”,
University: Jadavpur University
Date of award: 28.08.2024

Name: Dr. Sanjib Das
Title of the Thesis: Multidimensional approaches in developing a vaccine against circulating strains of *Helicobacter pylori*"
University: Jadavpur University,
Date of award: 07.02.2025

Post and Pre- Doctoral Fellows

Pre-Doctoral Fellow:
Mr. Prolay Halder, SRF-ICMR
Mr. Soumalya Banerjee, SRF-UGC
Mr. Sanjib Das, SRF-UGC
Mr. Arindam Mukherjee, JRF-UGC

S. Bhattacharya (Principal Investigator), Biochemistry Division

Development of new therapeutic against *Vibrio cholerae* to reduce pathogenesis

Cholera, a diarrhoeal disease caused by the Gram-negative bacterium *Vibrio cholerae*, is a global health threat for developing countries due to its high transmissibility and increased antibiotic resistance. There is an urgent need for alternative strategies, with an emphasis on anti-virulent approaches to alter the outcome of bacterial infections, due to rapid emergence of antimicrobial resistant strains. *Vibrio cholerae* causes cholera by secreting virulence factors in the host intestinal epithelial cells. These, virulence factors facilitate bacterial colonization and cholera toxin production during infection. Here, we demonstrate that sodium butyrate (SB), a small molecule, had no effect on bacterial viability but was effective in suppressing the virulence attributes of *V. cholerae*. The production of cholera toxin (CT) was significantly reduced in *V. cholerae* El Tor strain and two clinical isolates due to sodium butyrate treatment. Analysis of mRNA and protein levels further revealed that SB reduced the expression of the ToxT-dependent virulence genes like tcpA and ctxAB. DNA-protein interaction assays, conducted at cellular (ChIP) and *in vitro* conditions (EMSA)(Fig1), indicated that SB weakens the binding between ToxT and its downstream promoter DNA, likely by blocking DNA binding. Furthermore, the anti-virulence efficacy of SB was confirmed in *in vivo* models (Fig2). These findings suggest that sodium butyrate has the potential to act as anti-virulent agent against *V. cholerae*.

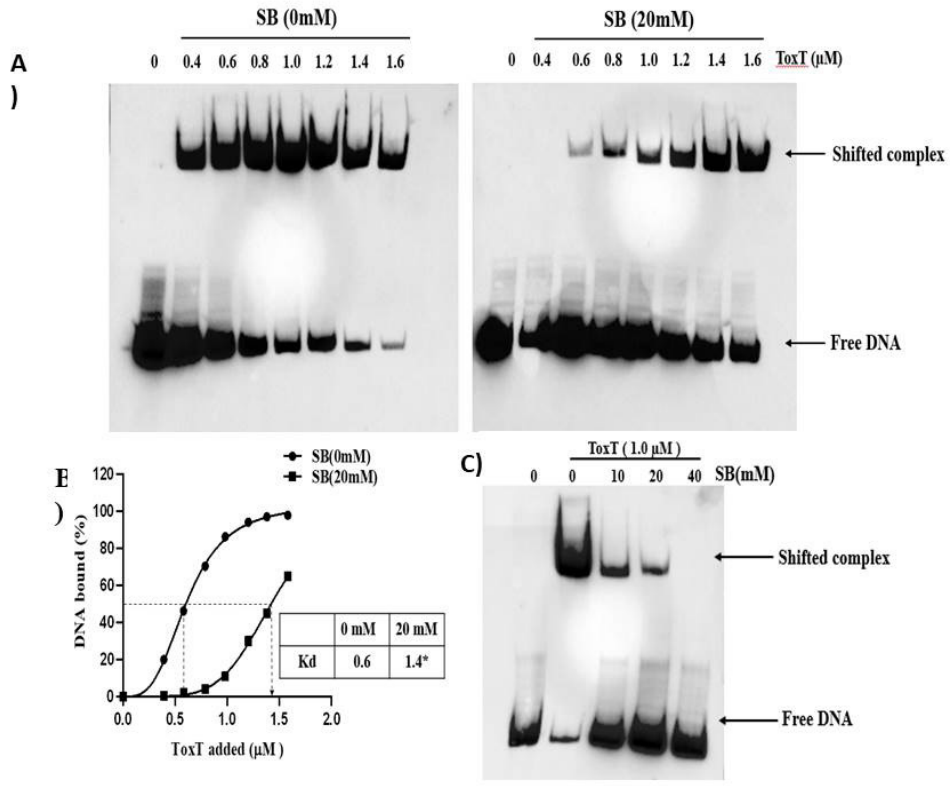


Fig 1: A) For EMSA, a 150 bp P_{tcpA} DNA fragment was biotin-labeled and then used as a DNA probe. Purified ToxT protein was added to the probe (1nM) in the presence or absence of SB (20mM). B)The relative affinities of ToxT protein in the presence or absence of SB were compared using the data from panel B. The percentage of bound DNA was calculated and plotted against the concentration of ToxT added. The Kd is shown in the inset.

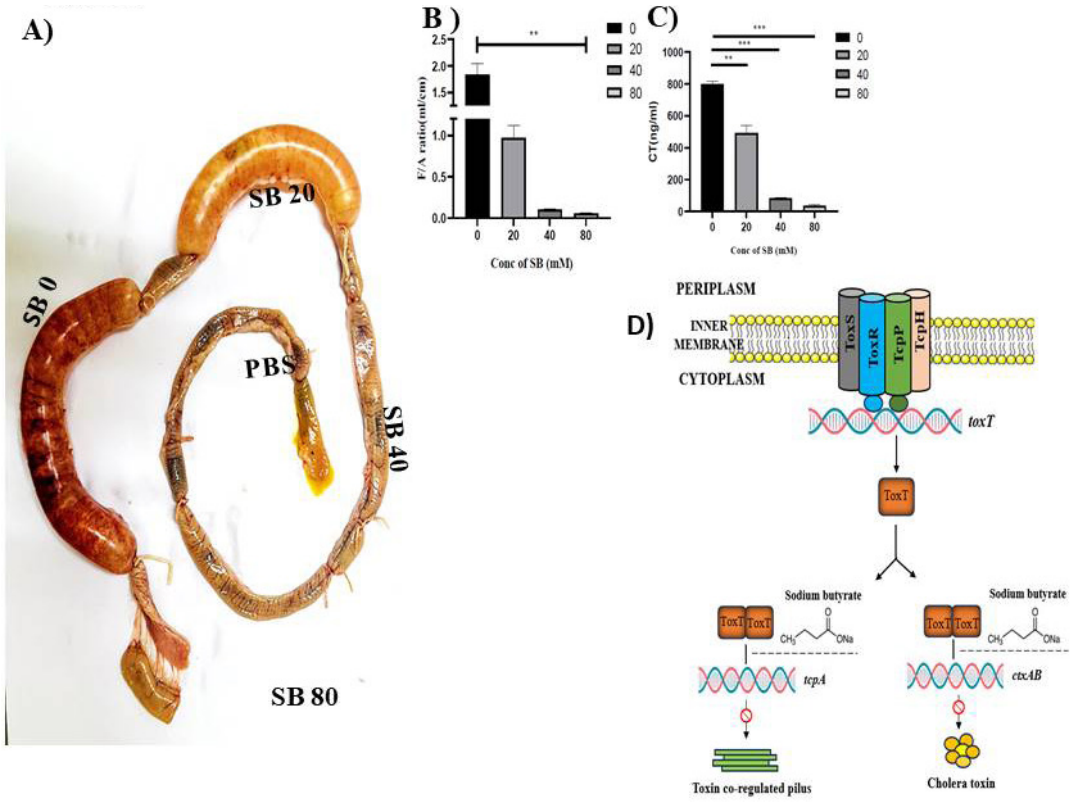


Fig 2: Each loop was infected with 10^9 CFU per ml *V. cholerae* N16961 in the presence or absence of SB (20, 40, and 80 mM). After 18 hr, the animals were euthanized, and the loops were removed. A) The image of the recovered rabbit intestine segment presented here is representative of three independent experiments.
B) The loop length and the amount of fluid accumulated in each loop were measured, and the amount of fluid (ml) per unit length (cm) of the loop was determined.
C) CT ELISA of rabbit ileal loop fluid produced in the presence and absence of SB.D) Model showing the inhibition of virulence cascade in *V. cholerae* by SB.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

• 6th Global Cancer Summit - 2024 (GCS-2024). JN Tata Auditorium, Indian Institute of Science, IISC Bengaluru, Karnataka, India Organized by BiogEnesis Science Cluster Oral Presentation Title: Activation of Autophagy by inhibiting HMGB1 (High Mobility group Box1) reduces *Helicobacter pylori* infection

Ph.D. Awarded

Name: Dr. Uzma Khan
Title of the thesis: Therapeutic Targeting of Autophagy in Gastric Cancer
University: Jadavpur University
Date of award: 23.04.2024

Post and Pre-Doctoral Fellow

Pre-Doctoral Fellow
Ms. Priyanka Maitra, SRF-CSIR
Ms. Sushmita Kundu, SRF-UGC
Ms. Sourin Alu, SRF-UGC
Ms. Abhishek Singh, JRF-CSIR

S. Basak (Principal Investigator), Bioinformatics Division

Development of next generation drug library and information resource of the alternative therapeutic use of FDA approved drugs by Kernel-based machine learning integration of molecular structure, molecular activity and phenotypic data

This study aims at the screening of thousands of FDA approved drugs to predict their potential alternative use through machine learning. We have successfully generated the similarity kernels underpinning the repurposing framework. First, the chemical similarity matrix was constructed by representing each FDA-approved compound as a binary substructure fingerprint and computing weighted cosine correlations across all drug pairs. Next, the target-based similarity matrix was derived by aligning drug target protein sets using normalized Smith–Waterman scores. The side-effect similarity matrix via Jaccard indices calculated on SIDER annotations. Finally, the disease phenotypic similarity matrix was created by mining MeSH terms from OMIM and HPO annotations and computing semantic/text-mined and ontology-based similarity scores. With these four kernels in hand, we implemented Kronecker-product fusion strategy, which takes the maximum similarity across metrics to produce a unified drug–disease kernel that preserves positive symmetry.

Genetic exchanges shape the evolutionary diversification among *Shigella phages*

The horizontal transfer of genetic information in bacteriophages result in the formation of mosaic genomes. Shigellosis is emerging as a concerned health issue in the present era of antibiotic resistance. Bacteriophages are also known to drive the genetic exchanges among their host bacteria enabling them to gain more fitness. The primary aim of our study was to identify the genetic exchanges occurring in the *Shigella* phages and associate them with the infecting host species, phage lifestyles to study the constraints acting upon it. The genomic traits were studied with reference to exchanged genes and the ancestral genes with their impact on the dynamics of protein evolution along with detailed curation of the functions being gained due to lateral transfer. Host range expansion is observed in the present study among the *Shigella* phages. However, *Shigella* phages do not have the propensity for genetic transfer with dissimilar lifestyles. The increase in gene pool of bacteriophages due to horizontal transfer can result in increase of the host range making them more suitable for their applications in phage therapy against antibiotic resistant bacteria.

Comparative evolutionary genomics of vertebrate toll-like receptor (TLR) genes

Toll-like receptors (TLRs) act as the first line of defense against infecting pathogens though the detection of the pathogen-associated molecular patterns (PAMPs). These genes play important role in triggering the adaptive immune response in vertebrates. TLR diversity has been discovered in both species and individuals, not just in pathogen identification but also in downstream signaling pathways. In this study we aim to investigate the diversity of TLR genes found in mammals, birds, and fish. Understanding the evolution of TLR genes in different species can provide us with a comprehensive understanding of the changes in their ligand detecting properties and host-pathogen interactions. In response to constantly evolving pathogens, TLR genes appear to evolve quicker than other locations in the genome. Genetic variation in functional immunity-associated genes such as TLRs is important because it provides a good model for studying the selection pressure applied by microbes on the host genome.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- Attended a conference held at Kolkata on "Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR)" conducted by ICMR-NIRBI and DBT-IBSD during 04/04/2024 to 05/04/2024.
- Invited as a Resource Person in the hands-on training workshop on "Laboratory Diagnosis of Emerging Viral Diseases held at Kolkata conducted by VRDL, ICMR-NIRBI during 14/05/2024 to 16/05/2024.
- Delivered an invited lecture at the Clinical, Microbial, Computational and Discovery Genomics Conference conducted by Genomics Analysis & Technology Conference and Bencos Scientific Society during 24/08/2024 to 25/08/2024.
- Delivered an invited lecture at the National Conference on "Emerging Trends in Bioscience Research (ETBR) 2025" held at Aliah University, Kolkata during 05/02/2025 to 06/02/2025
- Chaired a session at the National Conference on Emerging Trends in Bioscience Research (ETBR) 2025" held at Aliah University, Kolkata during 05/02/2025 to 06/02/2025
- Attended an international Symposium on Health Technology Assessment USHTA) 2025 held at Delhi conducted by Department of Health Research Government of India during 05/02/2025 to 06/02/2025

Ph.D Awarded

Name: Dr. Manisha Ghosh
Title of the thesis: Evolutionary Selection on Toll-like Receptor (TLR) Genes
University : Jadavpur University
Date of award: 21.01.2025

S. Das (Principal Investigator), Clinical Medicine Division

Host-pathogen interactions in human *Salmonella enterica* serovar Typhi infection.

Mechanisms underlying phagososmal survival of *Salmonella* Typhi (*S.* Typhi) inside human macrophages remain poorly understood. We had previously reported that a eukaryote-like serine/threonine kinase of *S.* Typhi (T4519) that activates NF-κB and the pro-inflammatory cytokines contributes to survival within macrophages. We now show that T4519 binds to Toll-like receptor 2 (TLR2) on human monocyte-derived macrophage (MoM) cells, perhaps through its NH2-terminal glycine rich repeat domain. This leads to the activation of downstream signaling pathways, resulting in transcriptional repression of cystatin B, a cathepsin B inhibitor and consequent activation of cytosolic cathepsin B, leaked from the lysosomes of the infected cells. We further show that active cytosolic cathepsin B cleaves IKB-α, resulting in nuclear translocation of NF-κB and transactivation of its target genes. The latter includes reactive oxygen species (ROS), which in turn induces lysosomal membrane permeabilization (LMP) and promotes phagosomal survival of *S.* Typhi. This study describes a unique mechanism of the exploitation of host NF-κB signaling pathways by bacterial pathogens to facilitate its own persistence within human macrophages.

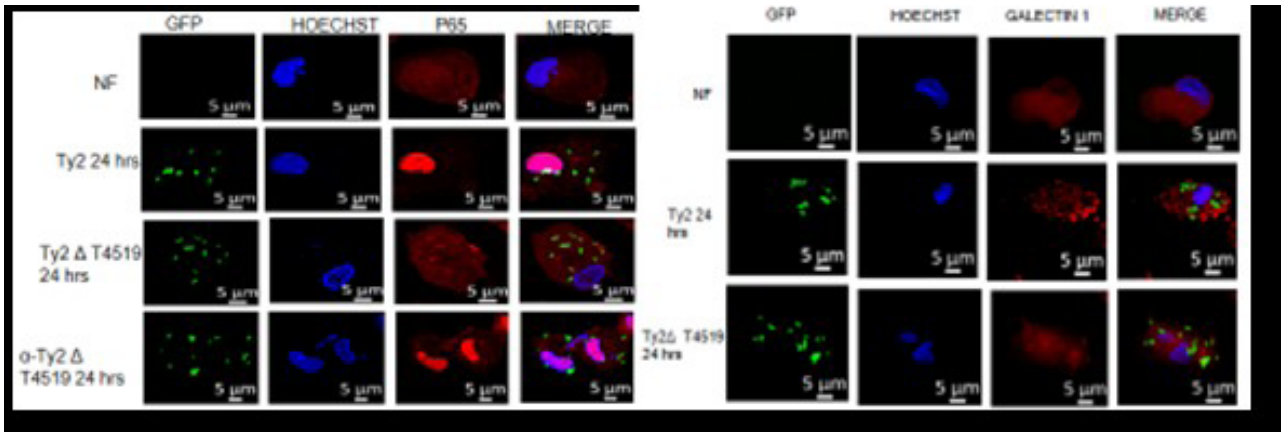


Fig 3: T4519 promotes p65 nuclear translocation and lysosomal membrane permeabilization.

Characterization, *in vivo* diagnosis and role of pathogenesis of L-Form *Salmonella* Typhi

To evade killing by cell wall targeting antibiotics, bacterial pathogens may turn into cell wallde-ficient variants, the so-called L-form, which is believed to cause persistent or recurrent infection. We had earlier shown that L-form *Salmonella* Typhi, developed under the stress of progressively increasing concentrations of ampicillin is capable of *in vitro* and *in vivo* infection. L-form biology suggests regulation by epigenetic rather than genetics mechanisms. We compared genome-wide methylation patterns of the parental and L-form *S.* Typhi, using Oxford Nanopore sequencing and methylation-specific PCR and identified unique 4mC, 5mC and 6mA residues underlying the Lform phenotype that may be used for *in vivo* diagnosis of the L-form and to explore its specific role in pathogenesis.

A multicentric longitudinal cohort with nested case-control study for the assessment of immunological correlates of long-term protection against SARS-CoV-2 infection among fully vaccinated health-care workers

We have conducted a multi-center study for long-term (>2 years), SARS-CoV-2-specific immune response in fully vaccinated individuals from India. The study explores humoral and cell-mediated immune responses, including the contribution from different T cell subsets and the factors influencing these responses, paving the way for future vaccine design. The reduction in antibody secreting cells and circulating IgG suggests a decline in humoral immunity, indicating that vaccine-induced protection may wane over time. However, the persistence of memory T cell subsets indicates induction of long-term immune response. These findings suggest that future vaccine design strategies should be directed towards eliciting a robust T cell response.

Development of broad specificity conjugate vaccine against *Salmonella* Typhi, Paratyphi and non- typhoidal *Salmonella* infections

No vaccine is currently licensed against *Salmonella* Typhimurium and Paratyphi. We have developed a multivalent glycoconjugate vaccine, containing high molecular weight complexes of *Salmonella* Typhimurium O-specific polysaccharide (OSP) and recombinant T2544 that conferred simultaneous protection against *S.* Typhi, *S.* Paratyphi and *S.* Typhimurium and crossprotection against *S.* enteritidis in mice. The candidate vaccine induced rapid seroconversion with high titers of serum IgG and IgA against both OSP and T2544, a strong antibody recall and significantly raised serum bactericidal antibody (SBA) titers against different *Salmonella* serovars. Further, there was elevated intestinal secretory IgA and bacterial motility inhibition by the secretory antibodies along with robust induction of T effector memory response, which indicates long term efficacy of the candidate vaccine.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- Poster Presentation by Sudip Dey, ICMR-SRF: "*Salmonella* Typhi infection in human Primary Monocyte and it's role in Host Metabolic regulation" at the Annual Meeting of the Indian Immunology Society, 17-20th October'2024 (Immunocon 2024), IISc, Bengaluru.
- Suparna Chakraborty, Research Scientist-I: Received IUIS/AAI travel award to attend The AAI Advanced Course in Immunology of the AAI Summer Courses in IMMUNOLOGY, held on July 28-August 2, 2024, at the The Westin Copley Place, Boston, MA.
- Suparna Chakraborty, Research Scientist-I: Oral Presentation titled "Heterologous prime-boost strategy with mucosal CTB-T2544 priming and systemic T2544 boosting protects against typhoidal *Salmonella*" at Anusandhan 2025, organized by the Bose Institute on March 7–8, 2025, at the Bose Institute, UAC, Sector V, Kolkata.
- Dr Santasabuj Das, Sc G: Oral presentation on "Macrophage survival of *Salmonella* Typhi mediated by bacterial serine–threonine kinase induced lysosomal membrane permeabilization through the manipulation of Toll-like receptor2 cystatin b-cathepsin B-NF-kB-reactive oxygen species pathways" at the 60th Anniversary Ceremony US-Japan Joint Panel Meeting on Cholera and other bacterial infections and 25th International conference on emerging Infectious Diseases (EID), held on 10 -16th March 2025 in Tokyo, Japan.
- Risha Halder, SRF-UGC Received travel award from 23rd Annual Congress of Korean Society for Parenteral and Enteral Nutrition (KSPEN) during June 21-22,2024.
- Risha Halder, SRF-UGC gave an Oral presentation on 'Preventive strategy to reduce shigellosis in a newly developed oral infection mouse model using a recombinant protein based subunit vaccine against *Shigella* sp., organised by 17th ASCODD, 8-10th December 2024, Nepal.

• Swarnali Chakraborty DST-INSPIRE SRF -3rd place holder in poster presentation at Genomics Analysis & Technology Conference GATC Lite conference from 24th-25th August, 2024 at Vedic Village, Kolkata

• Swarnali Chakraborty DST-INSPIRE SRF- Poster presentation on "Serine-threonine kinase T4519 promotes *Salmonella* Typhi survival in human macrophages through the modulation of cystatin B-cathepsin B-NF-κB axis" at Genomics Analysis & Technology Conference GATC Lite (East) from 24th-25th August, 2024 at Vedic Village, Kolkata.

Patent(s) filed/accepted /technology developed

- Das S, Halder R, Das S. A glycoconjugate vaccine composition against *Salmonella* Typhi and *Salmonella* Paratyphi. Patent application no. 202411074276; filing date October 1, 2024.

PhD Awarded

Name: Dr. Suparna Chakraborty
Title of the Thesis: Studies on host protective response to Salmonella infection
University: Jadavpur University
Date of award: 19.11.2024

Name: Dr. Risha Haldar
Title of the Thesis: Designing board-specificity, multi-subunit vaccines against enteric infections and studies on their immunogenicity and protective efficacy in animal models
University: Jadavpur University
Date of award: 08.03.2025

Post and Pre-doctoral fellows:

Post-Doctoral Fellow:
Dr. Sneha Mitra, Scientist-C
Dr. Lena Dhar: Research Scientist -I
Dr. Suparna Chakraborty, Research Scientist-I

Pre-Doctoral Fellow:
Ms. Swarnali Chakraborty, SRF-DST Inspire
Mr. Sudip Dey, SRF- ICMR

P. Indwar (Principal Investigator), Clinical Medicine Division

Coorelating antibiotic prescription patterns with resistance in commensal bacteria for one health based stewardship intervention

Contributing factors to the increase in AMR are the overuse and misuse of antimicrobial drugs, including their use in livestock. Antimicrobial resistance (AMR) is not restricted only to pathogenic bacteria, but the commensal gut bacteria also play a role in harboring and transmission of Antimicrobial Resistant genes (ARGs). *E. coli* is commonly found as a commensal gut microbiota and is considered as a reservoir of acquired AMR determinants. A recent study from Kolkata has reported the NDM-5 Carbapenemase-Encoding Gene (bla_{NDM-5}) - Positive Multidrug Resistant Commensal *Escherichia coli* from diarrheal patients (Chowdhury et al 2022). This is an ominous sign as the emergence of NDM- producing Enterobacteriaceae is an increasing threat to global health. Further epidemiological and clinical studies are needed to elucidate the mechanisms of emergence, evolution and dissemination of commonly used antibiotics including NDM-5 in commensal *E. coli* and other gut microbes. So, commensal organisms may be included for testing as a reservoir of acquired AMR determinants.

Similarly, in animals and birds, *E. coli*, Non-typhoidal *Salmonella*, *Staphylococcus*, and *Clostridium perfringens* can act as commensals carrying antimicrobial resistance genes. The resistance genes may be transferred to the human commensals (*E. coli*, *Staphylococcus epidermidis*, *Clostridium perfringens* etc.) or pathogens (*Salmonella*) or both during cross-transmission of infections from animal to humans. Hence, it is important as per one health perspective to study antibiotic prescription practices, antibiotic consumption behaviour, and resistant patterns, of these commensals and also to identify major parameters responsible for the presence of animal associated antimicrobial resistant bacteria, the risks of their transmission from animals to humans, and the magnitude of the public health threat due to antimicrobial organisms and anti-microbial resistance genes in the environment for one health-based intervention.

AMR requires a multisectoral approach. One health brings together multiple sectors and stakeholders from human, terrestrial and aquatic animal and plant health, food and feed production and environment to communicate and work together for successful implementation of programmes, policies and research for better health outcomes. The burden of AMR in livestock and food animals are not well documented in India. However, there are sporadic, small, localized studies from our country and there's limited evidence that can be extrapolated to the national level. The emergence of AMR from antibiotic overuse in the animal sector is reported to be an unmeasured burden in India due to stringent implementation of protocols even in presence of a few regulations (WHO AMR and containment India 2016 & NCDC 2018).There a few reports on integrated approach for antibiotic stewardship from India. So, this study aims to correlate antibiotic prescription patterns with resistance in commensal bacteria for one health-based stewardship intervention.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- WHO- EPI WIN WEBINARS
- Population Health Research Workshop-
- Clinical Intent Meeting-

S. Kanungo, (Principal Investigator), Division of Epidemiology and Data Management

Impact assessment of administering OCV in selected cholera vulnerable district of West Bengal using state health machinery

An intramural project is currently underway to evaluate the impact of a whole-cell killed oral cholera vaccine when administered through the public healthcare system in rural West Bengal. The vaccine was delivered through both booth-based and household campaigns by state healthcare workers. Administered in two doses, 14 days apart, the initiative aims to assess the vaccine's effect on population-level disease dynamics and the associated healthcare costs for both providers and recipients. Coverage for the first dose was 66.5%, and 95% of those recipients received the second dose. The project is ongoing with active disease surveillance and is expected to significantly contribute to the development of India's National Cholera Control Plan, aligning with the WHO Global Task Force on Cholera Control's "End Cholera by 2030" initiative.

In parallel, an ICMR-funded, multicentre, randomized, double-blind trial is evaluating the antibody response following a single dose of Cervavac® compared to Gardasil® in healthy Indian girls aged 9–14 years. With low national coverage of two-dose HPV vaccination due to cost, supply issues, and high dropout rates, this trial seeks to determine whether Cervavac®, an indigenously developed vaccine, can offer a safe, immunogenic, and cost-effective alternative. A total of 168 girls have been enrolled, and follow-up is ongoing.

Additionally, a Phase III trial of DengiAll®, a live-attenuated tetravalent dengue vaccine by Panacea Biotec, is being conducted to address the absence of a specific dengue treatment. At ICMR-NIRRCH, 673 healthy adults aged 18–60 have been enrolled, with two years of safety and fever surveillance planned post-vaccination.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- Attended GTFCC WaSH Working Group (WWG) meeting: Meeting of the Global Task Force for Cholera Control (GTFCC) – WASH Working Group conducted by WHO – GTFCC from 09.05.2024-11.06.2024
- Attended Multidisciplinary Expert Meeting on "Addressing Ethical Concerns regarding Academic Trial/ Non-regulatory Trials/ Non-investigational Trials" conducted by ICMR Bio Ethics Unit, ICMR from 05.06.2024 -05.06.2024
- Attended DHR ICMR Health Research Excellence Summit 2024 conducted by ICMR from 27.08.2024 - 28.08.2024
- Attended webinar on "Interpeting Published Scientific Evidence" conducted by ICMR-DHR on 11.10.2024
- Attended webinar on National Learning Week Webinar on "Emerging Technologies in Health Sector-Present and future" conducted by ICMR on 23.10.2024
- Attended Round Table Meeting on "Advancing Pandemic Preparedness with Plug-and Play Vaccine Platforms(PPP) in India" conducted by ICMR from 28.10.2024-29.10.2024
- Attended webinar on BioE3 Policy for Fostering High-Performance Bio manufacturing conducted by DBT on 14.11.2024
- Attended webinar on Prevention of Sexual Harassment (POSH) at Workplace conducted by ICMR- NIRBI on 10.12.2024.
- Attended Webinar on Rapid Diagnostic Tests for Cholera - 18 December 2024 WHO-India conducted by WHO-India on 18.12.2024

- Attended webinar Adaptive trials: Principles and role of statistics conducted by ICMR from 17.01.2025-27.01.2025
- Attended webinar on Clinical Validation of In-Vitro Diagnostics conducted by ICMR on 28.02.2025
- Delivered an Invited Oral Presentation tilted “Bridging Evidence to Action: Identifying Priority Areas through Cholera Seroepidemiology and Spatial Clustering to Targeted Mass Vaccination in India” at the 60th Anniversary Ceremony and the 25th International Conference on Emerging Infectious Diseases (EID) in the Pacific Rim of the USJCMSP that was conducted by US- Japan Cholera Conference, Tokyo, Japan from 11.03.2025-15.03.2025.

D. Chakraborty (Principal Investigator), Epidemiology and Data Management Division

Evaluation of the effect of influenza and pneumococcal vaccination on mortality and hospitalizations in the elderly - a randomized controlled trial.

This is a national health research priority multicentric project where ICMR – NIRBI represent eastern zone.This multicenter study is being carried out to evaluate effectiveness of combined flu and pneumococcal vaccine in reducing all cause hospitalization and mortality among elderly. Secondary outcome measures are days of antibiotic therapy, respiratory morbidity and mortality particularly ILI, SARI, IPD, Pneumococcal Pneumonia, Vaccine type nasal carriage of Pneumococcus. In this open label clinical superiority randomized controlled field trial, 6568 elderly population (age 60 years and above) from four regions in India (each site is 1642) will be randomly assigned to intervention and control arm. Following informed written consent participants in intervention arm will receive 2 annual doses of pneumococcal vaccine (PCV13 followed by PPSV23) and 2 annual doses of quadrivalent flu vaccine. Control arm will receive 1 dose of Tetanus Toxoid. Participants will be followed up for next two years from 14 days after vaccination through telephone calls, home visit by research staff and clinic visit by participants on scheduled days for recording of their illnesses and other outcomes

Assessment of comorbidity pattern, HIV care services and socio-behavioural dynamics among People Living With HIV/ AIDS in different geo-climatic regions: A mixed method exploratory assessment.

Climatic Conditions and Geographical is supposed to impact care, support and treatment services of PLHIV in different regions sensitive to climatic variations and natural calamity. Physiological variation and changes in infectious agents may also call for different healthcare need in response to climate change. The present study has the following objectives: 1) To assess the co- morbidity pattern in PLHIV in different geo-climate region. 2) To determine the status of HIV care services and HIV treatment indicators in them. 3) To explore any climate sensitive socio-behavioural attribute impacting HIV response This mixed method sequential explanatory study is being carried out in five ART Centres in four different geo-climatic zone of West Bengal. From each zone 100 PLHIV were interviewed (50 male, 50 female) who are 18 years and above and residing for at least 3 years. Following measurements were done: Blood Pressure, Hb% Total RBC Count, WBC Count, N/L ratio, HbA1C, TSH, subsequently 6 persons (Male-3, Female-3) from each zone will be undergone In Depth Interview based on analysis of quantitative part to explore the impact of climatic condition in their HIV transmission and management. The study will give direction towards the holistic climate sensitive healthcare needs in PLHIV and therefor a cohort will be also generated for subsequent follow up and intervention study.

Development of a Framework to identify Research priorities for mitigating the impact of Climate Change on HIV Response in India

The overlap between climate change and HIV/AIDS is of paramount global public health importance, particularly since both disproportionately impact regions of global vulnerability. Overall, the pathways linking the two are more indirect, as there is no plausible explanation nor evidence of climate change's direct influence on the virus itself. The primary objective of this United Nation Development Program funded study is to develop a broad framework to identify research priorities for mitigating the impact of climate change on HIV response in India through synthesizing the evidences on issues associated with HIV/AIDS and Climate Change followed by evidence generated from three Technical Resource Group Consultation. The study has been completed and technical report and research brief were widely disseminated on 22nd April 2024. Based on identified priorities further research was taken up by ICMR- NIRBI jointly funded by UNDP and WHO.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- National Conference on Exploring Bioresources of India to fight against AMR, ICMR – NIRBI from 04.04.24 to 05.04.24
- Dissemination of Climate Change & HIV Report and Research Brief, ICMR- NIRBI & UNDP on 22.04.2024
- National Workshop on One Health and Agroecology. MoEFCC on 03.06.24
- Capacity Building on Geographical Information System, ICMR- NIE from 08.07.24 to 12.07.24
- Capacity Building on Systematic Review (Resource Person) WHO & ICMR – NIRBI from 05.08.24 to 09.08.24
- Regional ToT of HSS ANC and Prison (Resource Person) ICMR- NIRBI & NACO from 04.11.24 to 06.11.24
- State Level Training of HSS ANC (resource person),Andaman SACS from 10.12.24 to 11.12.24
- State Action Plan development of AMR in West Bengal (Domain Expert), Govt of WB from 11.01.25 to 12.01.25
- Expert Consultation on How India is Enabling and Leveraging Immunization for Better Health, IIT Kharagpur and Women`s Collective Forum on 23.01.25

F. Debnath (Principal Investigator), Epidemiology and Data Management Division

Anti-Microbial Resistance Research & Evidence Synthesis for Stewardship implementation and Surveillance program development framework assessment (AMRES)

This study was planned to assess the scope of implementing AMSP in three tier health facilities. It is a multi-tier convergent parallel study which envisages to develop a level specific customized framework for implementation of AMSP at all levels. The project is presently ongoing in twelve Government run institutions across three districts of West Bengal, namely South 24 Parganas; Bankura; Malda. Under this project we have evaluated total 2715 prescriptions of AUFI, ARI, UTI, ADD and collected appropriate specimen from 50% cases; conducted 27 IDIs; carried out survey among 245 prescribers and 450 community members. It has been observed that among the OPD prescriptions, APR of primary and secondary tier hospitals was 63.8% and 60.5% respectively. MPR was found to be higher in secondary tier hospitals. Even among the evaluated IPD prescriptions of above-mentioned conditions, secondary hospitals turned out to be vulnerable in terms of antimicrobial use indicators. However overall culture positivity ranged between 12 -14% for UTI cases across hospitals, 13-15% for rectal swab collected in ADD cases. *Escherichia*. *coli* remained the major organism causing UTI in both primary and secondary tier hospitals. However, *Klebsiella* spp. was identified more from urine specimens collected from secondary tier hospitals. *Shigella flexneri* 2a was identified to be the major organism causing acute diarrhoeal diseases both in primary and secondary tier hospitals. Resistance profile of the organisms was shared with the concerned district health authority which helped them to develop their own antimicrobial policy for common infection.

Point-of-Care Test (POCT) Based Decision-Making Algorithm vs. Behavioral Interventions Developed for Prescribers: Effectiveness in Promoting Rational Antibiotic Usage in Common Infections

The aim of this study is to identify intervention in the form of clinical algorithm based selected point of care test (POCT) followed by a Mobile Based Clinical Decision Support System and behavioral interventions for prescribers alone or in combinations for improving rational antibiotic usage in common infections (AUFI, ARI). The study sites are also been identified post discussion with West Bengal State Health Department. We have obtained all the necessary approval and started data collection. So far, we have recruited 400 participants in intervention and 450 participants in control arm. We are continuing data collection in field and developing the behavioral intervention using participatory action research method.

Acceleration of TB Elimination in selected districts of India

This is a multicentric project. In West Bengal, we are conducting this study in Murshidabad district. We are conducting active case finding in the community using the hand held X ray device in camp mode. The second round of active case finding started from September 2024 among the vulnerable population of Beldanga I block of Murshidabad. Presently, we have taken 1053 Xrays using the handheld Xray device. In the second phase an AI software has been installed by ICMR-HQ for its validation. We are comparing the AI reading of the Xrays with radiologist reading which has been considered as gold standard. The work is presently ongoing and an additional 2500 X rays need to be captured from community to achieve the study objectives. In this second round of ACF, apart from starting ATT for additional 6 patients, TPT has been initiated for their family members.

DLSS: Sentinel Surveillance for Tuberculosis burden in India 2023-2024" under the project strengthening and monitoring of Tuberculosis Elimination in India

This is an ongoing project. We have recruited the man power and obtained the necessary approvals from State Health Department. We have finished the cluster activity for Hooghly and North 24 Parganas district. Now we are conducting field activity in East Midnapore district.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- India Innovation Summit: Pioneering Solutions to End TB from 18.03.25 to 19.03.25.
- Dissemination of Climate Change & HIV Report and Research Brief, ICMR- NIRBI & UNDP on 22.04.2024.

M. G. Lewis (Principal Investigator), Epidemiology and Data Management Division

Under-Five Mortality in India: A Systematic Review and Meta-Analysis of Causes, Risk Factors, and Preventive Measures (2009-2024)

This study, funded by ICMR under the Ignition Grant (₹27,05,200), aims to conduct a comprehensive systematic review and meta-analysis to examine under-five mortality in India over a 15-year period (2009–2024). The objectives of the study are: 1) Analyze the trends in under-five mortality rates across India from 2009 to 2024. 2) Investigate the causes and risk factors of underfive mortality 3) Assess the effectiveness of various preventive measures and public health interventions implemented during this period.

To date, data have been extracted from 352 eligible studies, comprising 121 cross-sectional studies, 113 longitudinal studies, 37 interventional studies, 53 retrospective studies, and 28 case-control studies. This diverse and extensive body of evidence will enable rigorous quantitative synthesis and subgroup analyses to provide nuanced insights into the burden, determinants, and mitigation strategies related to under-five mortality in India. The findings are expected to support evidence based policymaking and targeted public health interventions to improve child survival outcomes nationally.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- Participated in the Young Scientists Induction Program' under the aegis of the Indian Council of Medical Research, Government of India from September 30, 2024, to October 26, 2024 at Indian Institute of Management Visakhapatnam (IIMV) Andhra Pradesh.
- Attended a three-month Post Graduate Certificate Course in Infectious Disease Modeling conducted by the Department of Community Medicine, All India Institute of Medical Sciences Nagpur from July 15 to September 21, 2024.
- Resource person for a session on 'Meta-analysis and hands on in Revman Software' in the "Sensitization workshop on Systematic review and Meta-analysis" conducted by All India Institute of Hygiene and Public Health Kolkata between September 11-13, 2024.
- Resource person for a session on 'Basic Biostatistics' in the "Workshop on Basics of clinical research and basic biostatistics" conducted by Model Rural Health Research Unit-Darjeeling West Bengal between January 28-30, 2025.
- Resource person for a session on 'Introduction to Data analysis' in the Workshop on "Basic Biostatistics and manuscript writing, health technology assessment and Pharmacoeconomics conducted by Model Rural Health Research Unit-Darjeeling West Bengal between March 20, 2025.
- Delivered statistical consultation services for the ICMR NAMS online program assisting researchers with data analysis, methodology, interpretation of results to ensure the robustness of their studies

M. Bhaumik (Principal Investigator), Immunology Division

Butyrate limits IBD through RNA binding protein AUF1 driven IL-27p28 mRNA stability and IL-10 surge from B1a-cells

B-cell depletion in unrelated pathologies triggers Inflammatory Bowel Disease (IBD). With an objectivity to understand complex immunopathology of IBD, we juxtaposed results from clinical samples and experimental colitis in mice for complementarity. We showed that experimental colitis displayed downregulation of RNA binding protein, AUF-1, reduced t½ of IL-27p28 mRNA and decreased IL-27 stifled polarization of B1a to IL-10 producing B10-cells (B10-cells). Butyrate treatment reversed the observed phenotypes. AUF1 can be considered the lodestar in IBD pathology as cell penetrating unique morpholino based knock-down of AUF1 in mice (AUF1-KD) developed colitis. The colorectal biopsies of IBD-patients essentially mirrored experimental colitis having decrease in AUF1, IL-27, IL-10 and increase in TNF-α expression compared to non-IBD patient biopsies. Explants of IBD-patients in the presence of butyrate *ex vivo* showed enhanced AUF-1, IL-27 and B10 cells and reduced TNF-α and IFN-γ as compared to without butyrate. Interestingly an inverse correlation was noted between clinical score and butyrate driven B10-cell expansion. To reinforce further importance of AUF-1, we showed that B10-cells derived from wild-type but not AUF1-KD mice cured experimental-colitis. This study epitomized two revelations: AUF1 wends gut homeostasis and B10 cells can be used as cell based personalized therapeutic.

Awards/Honours received

Selected for woman in Immunology by IIS 2025

Conferences/ Seminar/ Workshops/ Meetings/ Trainings Attended

- "Gut derived butyrate quell experimental colitis involving RNA binding protein, AUF1 -IL-27 axis and accelerating B1a to B10 polarization" conducted by MEDISH, University of Clermont-Ferrand Auvergne, France on 12.04.2024
- "Functional knockdown of RNA binding protein, AUF1 in mice by unique cell penetrating morpholino phenocopies colitis" conducted by IGRED, University of Clermont-Ferrand Auvergne, France on 07.05.2024
- "Gut derived butyrate protects experimental colitis involving RNA binding protein, AUF1-IL-27 axis and accelerating B1a to B10 polarization" conducted by MEDISH, University of Clermont-Ferrand Auvergne, France on 19.04.2024
- "Gut derived butyrate protects IBD and experimental colitis involving RNA binding protein, AUF1-IL-27 axis and accelerating B1a to B10 polarization" conducted by Cancer Research Centre Lyon (CRCL) France (Invited by Dr. Marc Billaud) on 11.05.2024
- "Gut derived butyrate protects IBD and experimental colitis involving RNA binding protein, AUF1-IL-27 axis and accelerating B1a to B10 polarization" conducted by TUM University Munich, Germany (Invited by Dr. Zehn Dietmar) on 22.05.2024
- "RNA-Binding Protein, AUF1 hods key roles in pathophysiological network of Inflammatory Bowel Disease" conducted by Calcutta Human Genome Consortium Monobikas Kendra Kolkata on 11.01.2025

- "Physiological networks and disease functions of RNA-binding protein AUF1 in Inflammatory Bowel Disease" conducted by SNU Biotalk, SNU Kolkata from 16.01.2025 to 17.01.2025

- "Functional knockdown of RNA binding protein, AUF1 in mice by unique cell penetrating morpholino disrupts gut barrier function and phenocopies collitis" conducted by SAIS Symposium 2025 IACS, Kolkata from 17.03.2025 to 18.03.2025

- "Functional knockdown of RNA binding protein, AUF1 in mice and in human colorectal organoids phenocopies colitis" conducted by SBC monthly seminar series Kolkata Chapter on 12.02.2025

Ph.D. Awarded

Name: Dr. Oisikha Das
Title of the Thesis: Study of the Impact of gut microbial butyrate on RNA binding protein, AUF-1 on regulation of gastrointestinal physiology
University - Jadavpur University
Date of award: 12.08.2024

Post and Pre-Doctoral Fellows

Post-Doctoral Fellow:
Dr. Oishika Das, Project Research Scientist

Pre-Doctoral Fellows:
Ms. Ankita Dutta, SRF-Project
Ms. Aaheli Masid, SRF-CSIR
Mr. Diganta Roy, JRF-UGC
Mr. Sutanu Acharya, JRF-DBT

S. Ganguly (Principal Investigator), Parasitology Division

Active surveillance of common enteric microbes from an infectious disease hospital, Kolkata

This hospital-based systemic surveillance study is successfully being conducted among patients admitted with diarrheal complaints at three hospitals in Kolkata: Dr. B C Roy Post Graduate Institute of Paediatric Sciences Hospital (BCRPGIPS), Salt Lake Sub-Divisional Hospital, Salt Lake, Kolkata (SLSDH), and ID & BG Hospital (IDBGH). Hospital based surveillance on parasitic pathogens in IDBGH showed positive cases of common enteric parasites as follows- 7.7% *Giardia lamblia*, 3.9% for *Cryptosporidium* spp and 2.7% *Entamoeba* spp. The percentage of positive cases from BCRPGIPS revealed 15% for *G. lamblia*, 6.6% for *Entamoeba* spp, and 8.3% for *Cryptosporidium* spp. In SLSDH, the total percentages for *Giardia* spp, *Cryptosporidium* spp, and *Entamoeba* spp were 5.1%, 0%, and 3.8%, respectively from April 2024 to March 2025. We also conducted a hospital-based cross-sectional study to investigate the prevalence of *C. cayetanensis* infection and associated risk factors among diarrheic patients. The overall prevalence of *C. cayetanensis* in the study region was determined to be 2.23%. The manuscript on the prevalence of *Cyclospora* has been submitted to a renowned journal and is currently under peer review.

Development of a TaqMan-based multiplex qPCR assay for detection of common enteric parasites including *Cryptosporidium* spp.

This project is running successfully. The funds have been received, and project staff have been recruited. Probes for this study have been meticulously designed and procured. We have established a standardized protocol for screening clinical samples using isolated DNA. For the genus-specific first round PCR, the annealing temperature is set to 55°C for 60 seconds, while for differentiating *Entamoeba* species, it is set to 60°C for 60 seconds. Samples with a cycle threshold (CT) value exceeding 35 are classified as negative, indicating the absence of the targeted DNA sequences. We are conducting extensive testing on the probes to evaluate their specificity and sensitivity against the genomic DNA of the target parasites. We conducted blind tests on 62 clinical samples that had previously undergone conventional testing. All 62 clinical samples tested using the kit provide similar results compared to conventional methods. Our findings revealed that the designed qPCR method exhibited 100% specificity.

Identification of novel Anti-Parasitic Compound from Natural Medicinal source and their effect on *Giardia lamblia*.

This project is completed. Extracts from the indigenous herb *Andrographis paniculata* have shown very promising result against intestinal protozoan pathogens. Andrographolide (ADG) has been identified to be the potent active compound, having the antiparasitic activity. This compound has demonstrated significant amoebicidal and anti-giardial activities both in-vitro and in-vivo. It also ameliorated the associated intestinal damage caused by these infections. The safety profile of andrographolide enhances its appeal as a promising natural and low-risk treatment option for patients

Exploring the Antiprotozoal Activity of Ursolic Acid on *Entamoeba* spp

Cytotoxic effect of Ursolic acid on viable trophozoites has been evaluated. A concentration dependent decline in viability for both *Entamoeba histolytica* and *Entamoeba moshkovskii* was observed, affirming Ursolic acid's cytotoxic effect on these parasites. The IC_{50} (inhibitory concentration 50%) of Ursolic acid against *E. histolytica* is 21.31 µg/mL. *E. moshkovskii* was more resistant to Ursolic acid, with an IC_{50} of 159 µg/mL, which demonstrated species-specific susceptibility to the drug. An Annexin V-FITC/Propidium Iodide (PI) apoptosis assay

was performed to determine the mechanism of cell death mediated by Ursolic acid in *E. moshkovskii*. *E. moshkovskii* cells were treated with gradually escalating doses of Ursolic acid (25, 50, 100, 125, 150, and 175 µg/mL) for 24 hours. Flow cytometry analysis demonstrated a dose dependent shift from viability to early apoptosis and eventually to late apoptosis/necrosis. At 25 µg/mL, most cells were still viable with little Annexin V binding. At 50–100 µg/mL, early apoptotic populations increased significantly, suggesting phosphatidylserine externalization. At 125–175 µg/mL, late apoptotic and PI-positive populations predominated, suggesting permanent membrane damage and DNA fragmentation.

Studies on the role of *Leishmania donovani* Mevalonate Kinase (LdMVK) in modulation of host innate immune response and Autophagy in visceral leishmaniasis.

The study has successfully elucidated the critical role of LdMVK in modulating the host immune response, particularly through the activation of TLR2 and TLR4 pathways. It has provided a comprehensive understanding of the involvement of key adaptors, including MyD88, TIRAP, and TRAF6, in downstream signaling, highlighting the significance of LdMVK in triggering MAP kinase pathways and NF-κB nuclear translocation. This discovery positions LdMVK as a promising immunotherapeutic target for visceral leishmaniasis (VL). Moreover, the study has significantly advanced the understanding of the structural characteristics of LdMVK, including its stability, amino acid and atomic composition, extinction coefficient, half-life, and secondary and 3D structural features. These insights have laid the foundation for predicting its interaction with other proteins and its flexible regions, which are critical for its function. Importantly, the research has also shed light on the potential role of LdMVK in modulating host cell autophagy, offering a deeper understanding of how the parasite manipulates cellular processes for its survival. These findings provide a solid basis for future research, paving the way for the development of novel therapeutic strategies targeting parasite-induced cellular mechanisms, thereby offering hope for more effective treatments against visceral leishmaniasis.

Studies on Comparative Pathogenicity of *Entamoeba moshkovskii* with *Entamoeba histolytica*.

Entamoeba moshkovskii, previously considered non-pathogenic, is increasingly linked to gastrointestinal symptoms and has emerged as the predominant amoebic infection in Eastern India, surpassing *E. histolytica* . Over 3% of patients with diarrhoeal symptoms were found to be infected with *E. moshkovskii*. With rising *E. moshkovskii* infections and declining *E. histolytica* cases, it is crucial to identify genes responsible for pathogenicity and investigate how metronidazole exposure affects both species. To evaluate the pathogenic potential of both the resistant and wild-type strains, we developed metronidazole-resistant strains of *Entamoeba histolytica* and *Entamoeba moshkovskii* through gradual adaptation to Metronidazole. Trophozoites were cultured under axenic conditions and subjected to stepwise increasing concentrations of metronidazole after calculating the IC_{50} of both species (1.6 ug/ml for *E. histolytica* and 9ug/ml for *E. moshkovskii*) towards metronidazole. From this study, we can check the expression of the pathogenicity-related genes of *E. moshkovskii*, differentiate the virulence factors between *E. histolytica* and *E. moshkovskii*, and elucidate how resistance impacts pathogenicity, whether it increases, decreases, or does not alter the parasite's virulence.

Coinfection Dynamics and Pathogenic Interplay between Parasitic Microorganisms and *Helicobacter pylori* for Unravelling the Complex Microbial Interrelationship

Coinfection with parasitic microorganisms and *Helicobacter pylori* is notably prevalent in areas with inadequate sanitation. These interactions can significantly influence disease outcomes by modifying immune responses and gastric environments. While *H. pylori* is well-documented for its association with gastritis and ulcers, parasites such as *Entamoeba histolytica* and *Giardia lamblia* have the potential to either exacerbate or alleviate its effects. This underscores the importance of understanding their interplay to enhance therapeutic strategies for affected populations. To date, we have successfully designed primers targeting the 16S rRNA gene of *Helicobacter pylori* and have standardized a PCR protocol for its detection in stool samples from patients experiencing gastric discomfort. Although we have not yet identified any cases of coinfection, we are conducting a systematic survey to investigate the prevalence of coinfection between these microorganisms. Simultaneously, we are developing a mouse model to investigate the dynamics of coinfection between *H. pylori* and intestinal parasites. This ongoing study will facilitate a better understanding of the mechanisms underlying coinfection and their potential implications for disease progression and host immune responses.

State wise prevalence mapping of soil transmitted helminthes in Indian children to support health impact evaluation. A Ministry of Health and Family Welfare, Govt. of India initiative

STH presents a significant challenge in developing nations, particularly impacting children, especially those in preschool and school-going ages, who are highly vulnerable to this infection. This initiative, directed by the Ministry of Health and Family Welfare, Government of India, aims to map the prevalence and severity of STH infection among school-going children across various states in India. The project has garnered support from WHO, DIWI, NCDC, different state governments, the Ministry of Health and Family Welfare, Government of India, and ICMR. Mapping has been completed in states such as Uttar Pradesh, Telangana, Chattisgarh, Tamil Nadu, Sikkim, Tripura, West Bengal, Assam, Meghalaya, Manipur, Mizoram, and Arunachal Pradesh. Primary surveys and pre-deworming prevalence mapping have been concluded, with post-deworming follow-up surveys currently underway in various Indian states.

Awards/Honours received

- Nominated as WAST Fellow since 9th January, 2025 by West Bengal Academy of Science & Technology (WAST)

- Received best oral presentation award at State Conference TROPACON WB chapter 2024 by Indian Association of Tropical Parasitology (IATP), 5th January, 2025

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- Invited to National Conference on “Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR)” (AMRC-2024) organized by Institute of bioresources and sustainable development (IBSD), Imphal, Manipur, ICMR-National Institute for Research in Bacterial Infections (ICMR-NIRBI) in association with Society for Ethnopharmacology; 4th April-5th April, 2024
- In person training and operational exercises to enhance current knowledge/ skill levels in “Cyber defensive operations and operational technology” New Delhi organized by National Critical Information Infrastructure Protection Centre (NCIIPC); 5th April- 14th April, 2024

- Invited to State Conference Tropacon WB chapter 2024 at ICMR-NIRBI, Kolkata organized by Indian Academy of Tropical Parasitology (IATP) & ICMR-NIRBI; 4th January- 5th January, 2025
- Poster presentation entitled 'Genomic Variability in oxidative stress management and Metronidazole metabolism in Giardia duodenalis local isolates' in State Conference Tropacon WB chapter 2024 at ICMR-NIRBI, Kolkata organized by Indian Academy of Tropical Parasitology (IATP) & ICMR-NIRBI, 5th January, 2025
- Karmayogi Bharat online Yoga Break at Workplace organized by Karmayogi Morarji Desai National Institute of Yoga (MDNIY) on 8th July, 2024
- In-person training program on "Cyber security preparedness for Health Sector' at CERT-In, New Delhi organized by The Indian Computer Emergency Response Team (CERT-In), 25thJuly-26th July, 2024
- Attended Webinar on Cyber awareness by The Indian Computer Emergency Response Team (CERT-In) and Information Security Education and Awareness (ISEA); 15th Oct- 18th Oct, 2024
- Attended Online training program on "Log Analysis Techniques and Management" by The Indian Computer Emergency Response Team (CERT-In) on 29th Oct, 2024
- Karmayogi Bharat online Orientation Module on Mission LiFE by Ministry of Environment, Forest and Climate Change on 5th Mar, 2025
- Karmayogi Bharat online Government E Marketplace by Institute of Secretariat Training and Management on 5th Mar, 2025
- Karmayogi Bharat online Motivation by Department of Personnel and Training DoPT on 5th Mar, 2025
- Karmayogi Bharat online Team Building by Department of Personnel and Training DoPT on 5th Mar, 2025
- Karmayogi Bharat online Overview of Viksit Bharat 2047 by Karmayogi Bharat on 6th Mar, 2025
- Karmayogi Bharat online Rajbhasha Hindi by Food Corporation of India (FCI) on 6th Mar, 2025
- Karmayogi Bharat online Right to Information Act - Part 1 & 2 by Institute of Secretariat Training and Management on 6th Mar, 2025
- Karmayogi Bharat online Basics of e-Governance and Digital India by Indian Institute of Public Administration on 6th Mar, 2025
- Karmayogi Bharat online Data Driven Decision Making For Government by Capacity Building Commission on 6th Mar, 2025
- Karmayogi Bharat online Stay Safe in Cyber Space by Indian Cybercrime Coordination Centre - 14C
- Karmayogi Bharat online Preventive Vigilance by Ministry of Steel, on 6th Mar, 2025
- Karmayogi Bharat online Decision Making by Institute of Secretariat Training and Management on 6th Mar, 2025
- Karmayogi Bharat online Al led Digital Transformation in Healthcare by Capacity Building Commission on 6th Mar, 2025
- Karmayogi Bharat online Constitutional Provisions Relating to Disciplinary Proceedings – Hindi by Institute of Secretariat Training and Management on 6th Mar, 2025
- Karmayogi Bharat online by Capacity Building Commission on 7th Mar, 2025
- Karmayogi Bharat online Public Procurement Framework of GOI by Department of Expenditure on 7th Mar, 2025
- Karmayogi Bharat online Public Grievance Handling and CPGRAM 7.0 by Institute of Secretariat Training and Management on 7th Mar, 2025
- Karmayogi Bharat online Introduction to Emerging Technologies by Capacity Building Commission on 7th Mar, 2025

- Karmayogi Bharat online Effective Communication by IIMB on 7th Mar, 2025
- Karmayogi Bharat online Noting & Drafting by Institute of Secretariat Training and Management on 8th Mar, 2025
- Karmayogi Bharat online Parliamentary Procedures by Institute of Secretariat Training and Management on 8th Mar, 2025
- Karmayogi Bharat online Preparation of Cabinet Notes by Institute of Secretariat Training and Management on 8th Mar, 2025
- Karmayogi Bharat online Office Procedure by Institute of Secretariat Training and Management on 8th Mar, 2025
- Karmayogi Bharat online Time Management by Institute of Secretariat Training and Management on 8th Mar, 2025

PhD Awarded

Name: Dr. Rituparna Sarkar
Title of the Thesis: Studies on Lipid signalling, involving Apoptosis, under Oxidative Stress in *Giardia lamblia*
University: Jadavpur University
Date of award: 28.08.24

Name: Dr. Tapas Haldar
Title of the Thesis: Identification of a novel Anti-Parasitic Compound from Natural Medicinal sources and their effect on *Giardia lamblia*
University: Jadavpur University
Date of award: 20.11.24

Name: Dr. Ajanta Ghosal
Title of the Thesis: Detection of Common Enteric Parasites in Kolkata and Characterisation of the Pathogenic Factors of Local Isolates of *Giardia lamblia*
University: Jadavpur University
Date of award: 26.11.24

Post and Pre-Doctoral Fellows

Pre-Doctoral Fellow
Ms. Chayanika Roy, SRF-UGC
Ms. Sweety Mal, JRF-UGC
Ms. Oindrila Das, JRF-UGC
Mr. Supratim Ghosh, JRF-ICMR
Ms. Arunima Sengupta, JRF-Project
Mr. Akash Prasad, Project Research Scientist-1

A. Pal (Principal Investigator), Pathophysiology Division

Metallo-protease Peptidase M84 from *Bacillus altitudinis* induces ROS-dependent apoptosis in ovarian cancer cells by targeting PAR-1

In spite of remarkable improvements in chemotherapy regimens to treat ovarian cancer, it still remains one of the most lethal gynecological malignancies with a high recurrence and mortality rate. Although cytoreductive surgery accompanied with platinum-based chemotherapy is the admissible treatment for epithelial ovarian cancer (EOC), the mortality rates have not improved markedly. For instance, ovarian cancer is ranked eighth among the top ten common malignancies affecting Indian females. Therefore, new therapies and alternative targets need to be developed to combat ovarian cancer. In this regard, the anticancer potentials of natural products have been extensively explored.

We have purified Peptidase M84 from *Bacillus altitudinis* in an effort to isolate anticancer proteases from environmental microbial isolates. This Metallo-protease had no discernible impact on normal cell survival, but it specifically induced apoptosis in ovarian cancer cells. PAR-1, a GPCR which is reported to be overexpressed in ovarian cancer cells, was identified as a target of Peptidase M84. We observed that Peptidase M84 induced PAR-1 overexpression along with activating its downstream signalling effectors NF-kB and MAPK to promote excessive reactive oxygen species (ROS) generation. This evoked apoptotic death of the ovarian cancer cells through the intrinsic route. In *in vivo* set-up, weekly intraperitoneal administration of Peptidase M84 in syngeneic mice significantly diminished ascites accumulation, increasing murine survival rates by 60%. Collectively, our findings suggested that Peptidase M84 triggered PAR-1-mediated oxidative stress to act as an apoptosis inducer. This established Peptidase M84 as a drug candidate for receptor mediated targeted-therapy of ovarian cancer

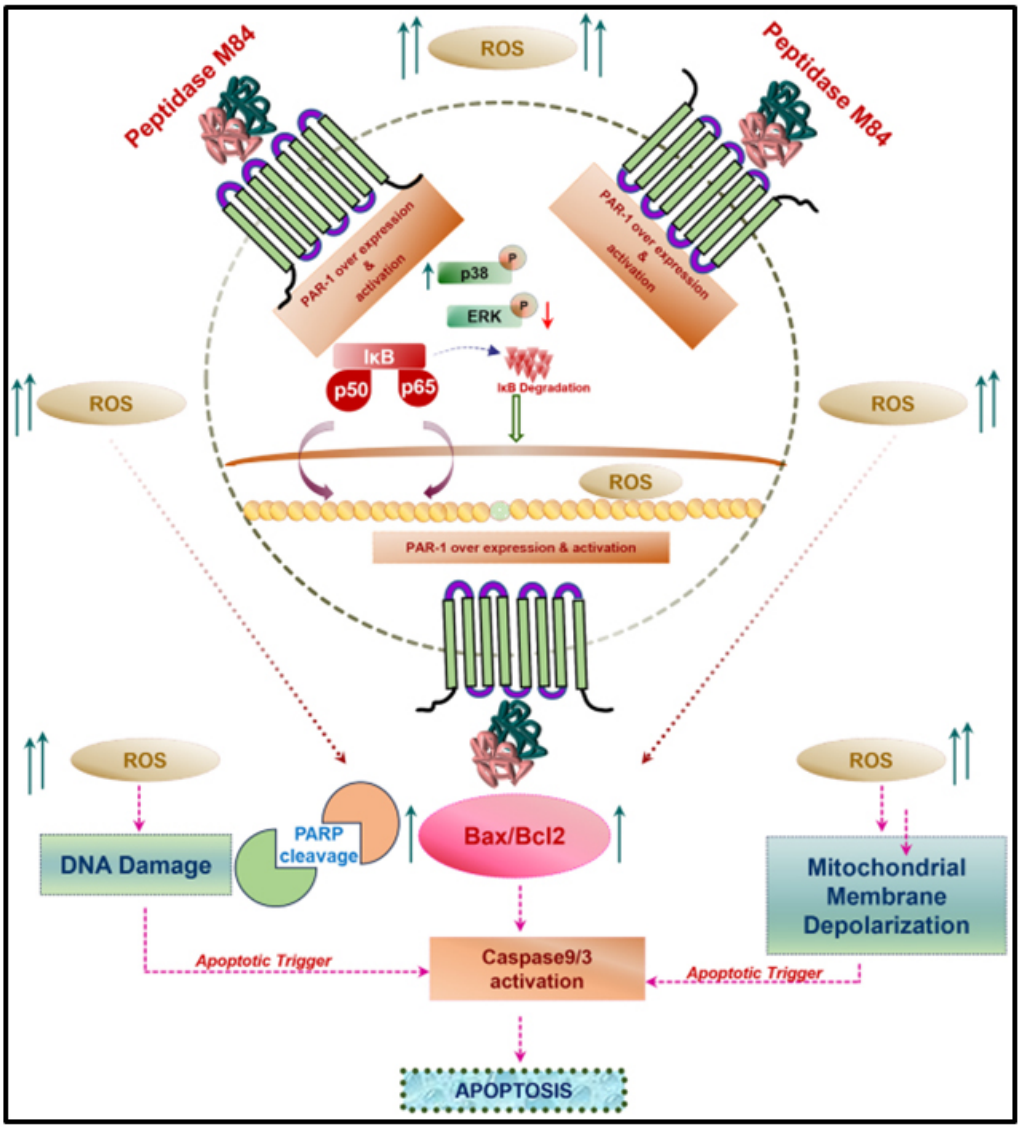


Fig 4: Schematic representation of Peptidase M84 induced apoptosis in ovarian cancer cells Peptidase M84 induced activation and overexpression of PAR-1 thus enhancing cellular ROS and activation of NF-kB, p38 followed by downregulation of pERK1/2. ROS mediated DNA damage induced changes in mitochondrial membrane potential and triggered the release of mitochondrial cytochrome c which subsequently activated caspase 3 ultimately promoting Bax, Bcl2 mediated intrinsic pathway of apoptosis. Enhanced ROS level in malignant cells allows to meet the threshold level of cellular ROS that affect cell survival earlier than the normal healthy cells ultimately triggering apoptotic cell death.
(Ref: Nag et al., iScience, June 21, 2024 https://doi.org/10.1016/j.isci.2024.109828ll)

Ph.D. Awarded

Name: Dr. Niraj Nag
Title of the Thesis: Therapeutic effect of microbial proteases in protease activated receptor (PARs) induced apoptosis in ovarian cancer cells
University: Jadavpur
Date of award: 12.11.2024

Post and Pre-Doctoral Fellows

Post-Doctoral Fellow:
Dr. Tanusree Ray, ICMR RA III
Dr. Rima Tapader, ICMR-RA I

Pre-Doctoral Fellow:
Mr. Dwiprohi Kar, SRF-CSIR
Ms. Nanda Singh, SRF-CSIR
Mr. Niraj Nag, SRF-UGC
Mr. Saibal Saha, SRF-UGC

M. Chawla-Sarkar (Principal Investigator), Virology Division

Molecular epidemiology of Group-A Rotavirus and other enteric viruses among children reporting with acute gastroenteritis: Comparative study from pre- and post-RV vaccine era

A significant decline (~50%) in RV prevalence was observed compared to pre-vaccination studies (pre-2018) in Kolkata, WB. Despite this decline, RV remains the major cause of infantile gastroenteritis with 17% positivity in children with gastroenteritis. Genotype analysis of the RV-positive samples revealed G3 as the predominant strain (53.3%), followed by G2 (20.0%) and G1 (13.3%), with 13.3% being untypeable. (Fig 5)

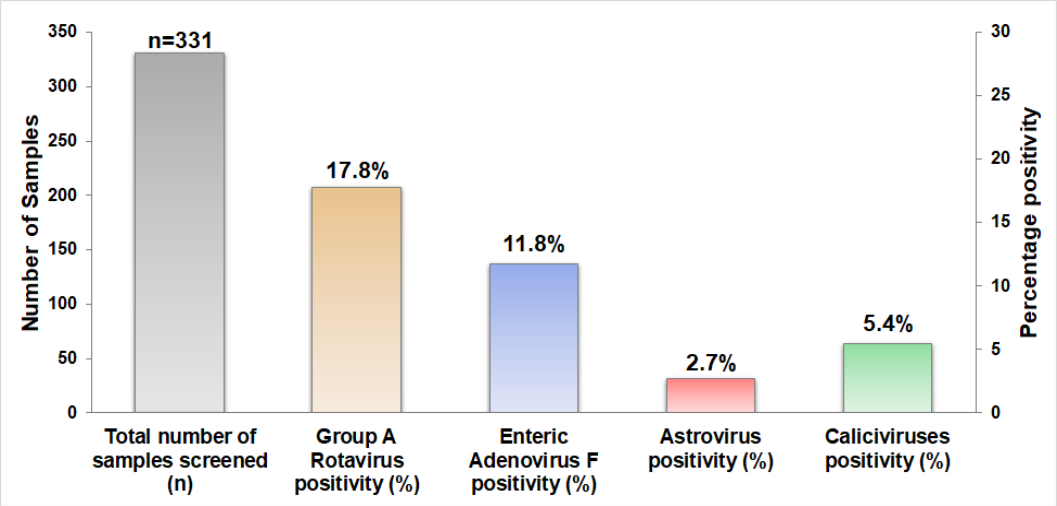


Fig 5: Positivity of Human Group A rotavirus and other enteric viruses among children (≤ 5 years) seeking healthcare facility during April'2024 to March'2025 in Kolkata, West Bengal.

An omics-oriented approach to identify key host metabolic pathways altered during Rotavirus infection scenario

Endo-metabolomic profiling was undertaken to identify key host metabolic pathways altered during infection by Rotavirus (RV). RV infection in cells was found to be associated with significant alteration of host cellular glutamate-aspartate metabolism pathway. RV replication in host cells is exclusively dependent on glutamine metabolism. Further investigation revealed increased activity of the host cellular aspartate aminotransferase (AAT) enzyme, during RV infection. Abrogation of aspartate biogenesis from glutamine by use of Aminooxyacetic acid (AOAA), a targeted inhibitor of cellular aspartate aminotransferase significantly curbed RV infection both *in-vitro* and *in-vivo* at non-toxic doses. Moreover, supplementation of downstream products of GOT/AAT, like aspartate and alpha-ketoglutarate, were able to rescue RV infection in AOAA treated cells. (Fig 6)

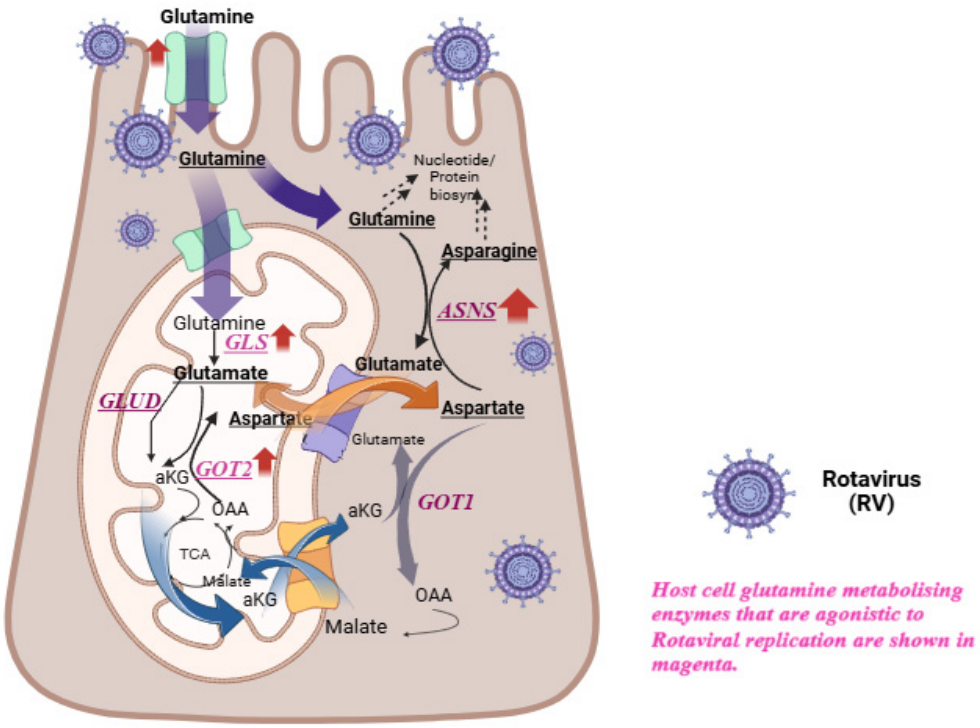


Fig 6: Schematic diagram depicting differentially orchestrated host cell glutamine metabolism during Rotavirus infection. Rotavirus infection in intestinal cells is accompanied by enhanced glutamine metabolism. Glutamine is increasingly utilized during rotavirus infection by downstream glutamine metabolizing enzymes like glutaminase (GLS), asparagine synthetase (ASNS) and indirectly by glutamate oxaloacetate transaminase (GOT2), thereby generating products like glutamate, asparagine, aspartate and alpha-ketoglutarate. Targeted inhibition of the aforementioned enzymes was found to significantly reduce Rotavirus replication in host cells. Restoration in viral replication was found on addition of intermediates like aspartate and specially asparagine, singly or in combination with alpha-ketoglutarate, underscoring the importance of glutamine metabolism in virus infection. Based on *in-vitro* results, treatment of Rotavirus infected suckling mice pups with AOAA, targeted inhibitor of GOT, also displayed significant anti-Rotaviral potency *in-vivo.*

A study to assess the cellular and viral drivers of Rotavirus induced necroptotic cell death

Rotavirus infection triggers programmed cell death like apoptosis and necroptosis which leads to severe damage in intestinal cells. Even after diarrhoeal episodes are over, the recovery in children takes long time due to malabsorption related to damaged intestinal villi. The components upstream of MLKL in RV-driven necroptosis were identified as the receptor-interacting serine/threonine kinases 3 and 1 (RIPK 3 and 1) on the host side and the RV-NSP4 on the viral side. RV-driven necroptosis refrains from using the RIPK1 kinase activity as the RV-NSP4 protein interacts with RIPK1. However it exploits RIP3 kinase activity for both replication and induction of necroptosis as GSK'872, a selective small molecule inhibitor of RIPK3 kinase suppressed RV induced MLKL phosphorylation and necroptotic cell death. For formation of mature necrosome, NSP4-driven ER to cytosolic Ca2+ efflux followed by binding of the Ca2+ onto the NSP4 leads to RHIM domain-dependent RIPK1-RIPK3 interaction, RIPK3-dependent MLKL phosphorylation, and eventual necroptosis. (Fig 7)

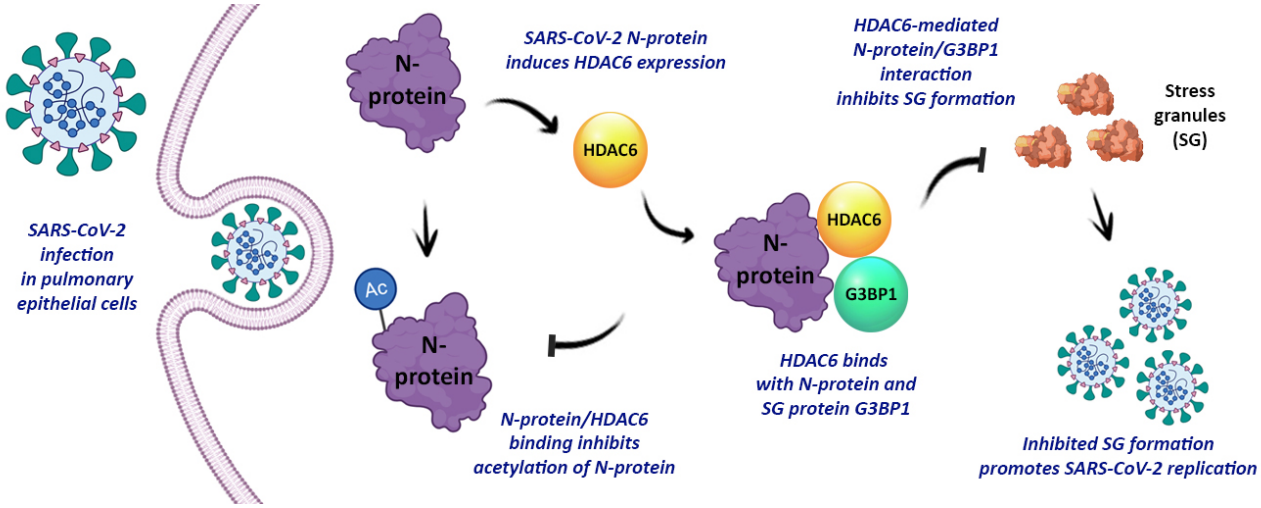


Fig 7: Schematic representation showing crosstalk between HDAC6 and SARS-CoV-2 infection. SARS-CoV-2 N protein interacts with and induces the expression of HDAC6. Subsequently, HDAC6 promotes the deacetylation of the N protein, which facilitates its association with G3BP1, leading to the disruption of cellular stress granules.

VIROLOGY

Study to assess the molecular mechanisms underlying the disruption of cytoplasmic stress granules during SARS-CoV-2 infection

Increase in HDAC6 expression was observed in cells following SARS-CoV-2 infection. The SARS-CoV-2 nucleocapsid protein (N protein) was identified as the primary viral factor responsible for upregulating HDAC6 expression. Downregulation of HDAC6 using shRNA or a specific inhibitor tubacin resulted in reduced viral replication suggesting proviral role of its deacetylase activity. Further investigations uncovered the interaction of HDAC6 with stress granule protein G3BP1 and N protein during infection. HDAC6-mediated deacetylation of SARS-CoV-2 N protein was found to be crucial for its association with G3BP1 and subsequent discruption of stress granules. (Fig 8)

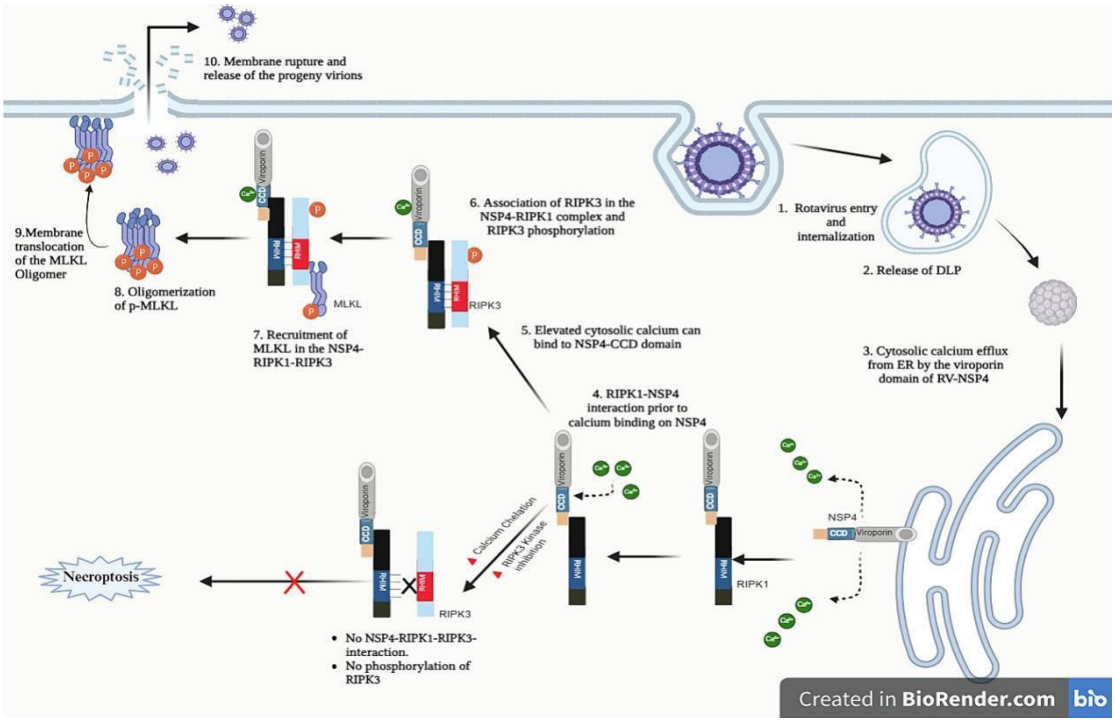


Fig 8: Mechanism behind RV-induced necroptosis activation. After entry and DLP release, RV-NSP embeds in the ER membrane, disrupting calcium homeostasis. NSP4, via its viroporin domain,

triggers calcium efflux into the cytosol and binds RIPK1. Cytosolic calcium binds near the viroporin domain and is required for RIPK3 to associate with the NSP4-RIPK1 complex. Calcium chelation or RIPK3 kinase inhibition (via GSK'872) blocks RIPK3 association and phosphorylation, but not NSP4-RIPK1 binding. RIPK1 and RIPK3 form the necrosome through RHIM interaction, leading to RIPK3 and MLKL phosphorylation. Phosphorylated MLKL oligomerizes, translocates to the plasma membrane, and induces necroptosis, releasing RV progeny.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- Delivered a talk titled "Traditional medicines- Revisting old weapons in quest of antiviral Therapeutics" at 2nd conference on the 'Innovations in sustainable drug discovery and development to combat the crisis of Antimicrobial Resistance" at Eminent College of Pharmaceutical Technology, Barasat on 27th Feb 2025 (Invited Speaker)
- Delivered a talk titled "Why there are less Women in STEM" on the occasion of National Science Day on 28th Feb 2025 at Asutosh College, Kolkata (Invited lecture)

Ph.D. Awarded

Name: Dr. Shreya Banerjee
Title of the Thesis: Elucidating The Role of Differentially Regulated Host Cellular Long Non Coding RNAs In Modulating Rotavirus Infection
University: University of Calcutta
Date of award: 28.11.2024

Name: Dr. Priyanka Saha
Title of the Thesis: Assessing genetic diversity of the circulating Inf A/H1N1 pdm09 in eastern India: Identification and characterization of synthetic small molecules as potential antiviral therapeutics
University: Jadavpur University
Date of award: 24.12.2024

Post and Pre-Doctoral Fellow

Post-Doctoral Fellow :
Dr Arpita Mukherjee, DHR Women Scientist

Pre-Doctoral Fellow :
Ms Shreya Banerjee, SRF-UGC
Ms Priyanka Saha, SRF-DST Inspire
Mr. Pritam Chandra, SRF-ICMR
Ms Ritubrita Saha, SRF-UGC
Ms. Ranjana Sharma, SRF-CSIR
Ms Suvrotoa Mitra, DHR- Women Scientist
Ms Doyel Biswas, JRF-UGC

A. Chakrabarti (Principal Investigator), Virology Division

Isolation and Characterization Diarrhea Associated Bacteriophages And Their Use In Phage Therapy

The rising threat of drug resistance due to improper antibiotic use is a serious global public health issue, making antibiotic treatments less effective and reducing treatment options. Phage therapy is a potential alternative for treating bacterial infections, providing a safe and targeted approach. Bacteriophages specifically attack harmful bacteria and can work alongside traditional antibiotics. This project focuses on isolating and studying new phages to create a diverse library aimed at treating infection caused by *V. cholerae* O1 biotype ElTor strains. The objective is to develop an effective phage cocktail formulations using unique combinations of cholera phage for combating cholera.

To date, over 30 bacteriophages that specifically target *V. cholerae* O1 have been isolated from various regions in India, along with few bacteriophages specific to *Salmonella* and *Shigella*. Newly isolated cholera phages were identified through plaque analysis and host range testing on 300 isolates of *V. cholerae*. Some strains showed resistance to various antibiotics. Based on host range, morphological, physicochemical and genetic characterization nine specific phages were selected which qualify the criteria of therapeutic use. Stable phages having no toxin or harmful genes were found highly effective in killing *V. cholerae* strains. *In vitro* killing curve experiments were carried out to ascertain the most effective phages to be utilized in the formulation of a phage cocktail. Moreover immune responses in mice indicated reduced inflammation after phage treatment. A superior phage cocktail was established through both in vitro and in vivo experimental results, indicating that the oral administration of phages following a *V. cholerae* challenge may successfully tackle the infection.

Targeting 14-3-3η Protein as Therapeutic Target Against Influenza Virus

The 14-3-3η protein regulates host responses to Influenza A Virus (IAV) by interacting with TRIM32 and PB1 polymerase. TRIM32 targets PB1 for degradation, limiting viral replication, while 14-3-3η binds phosphorylated TRIM32, preventing its autoubiquitylation and maintaining soluble TRIM32 levels. We show that 14-3-3η directly interacts with PB1, and its knockdown increases viral accumulation, cytotoxicity, cell death, and ROS production. Additionally, 14-3-3η supports mitochondrial health and promotes MDA5-mediated antiviral signalling, enhancing immune responses. This study is the first to demonstrate 14-3-3η's role in controlling PB1 degradation and activating innate immunity during IAV infection.

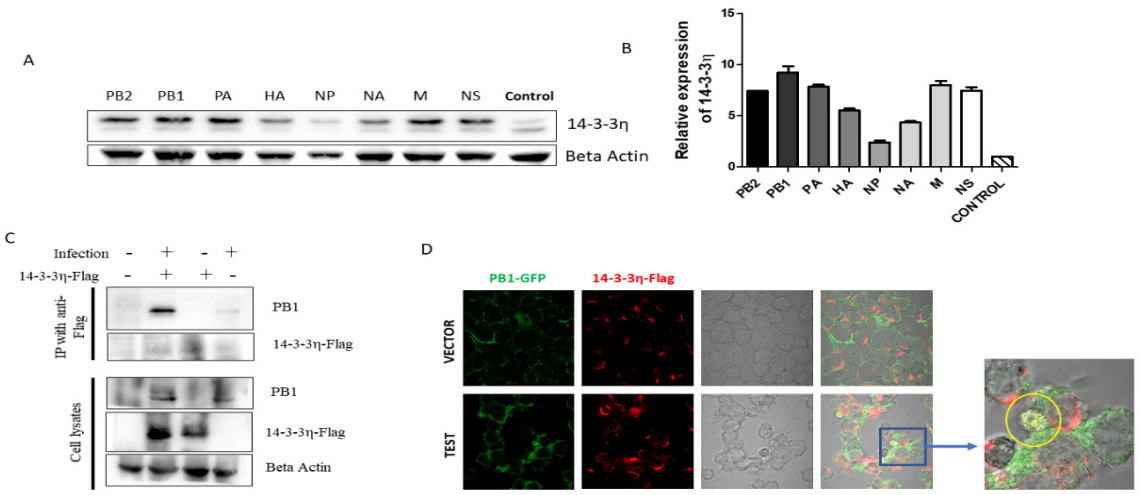


Fig 9: A) To identify the influenza A viral segment responsible for 14-3-3η induction, HEK293 cells were transfected with each of the 8 viral segments. Cell lysates collected at 24 h post-transfection were analyzed for 14-3-3η expression by western blot using a specific antibody.
B) Band intensities were normalized to the loading control. Data represent mean ± SD of three independent experiments. Statistical significance was assessed using an unpaired Student's t-test ($P \leq 0.05$, $P \leq 0.01$, $P \leq 0.001$).
C) HEK293 cells overexpressing Flag-14-3-3η (Lipofectamine 3000) were infected with influenza virus (MOI 0.1) for 24 h. IP with Flag antibody and PB1 immunoblotting showed a clear lane 2 band, confirming 14-3-3η–PB1 interaction.
D) HEK293 cells were transfected in two sets, one with GFP and PCMV-6A (FLAG) empty vectors, and the other with Plasmid constructs expressing PB1-GFP and Flag-14-3-3η, named as 'VECTOR' and 'TEST' respectively. Fluorescence microscopic analysis revealed interaction between PB1 and 14-3-3η.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- Delivered invited lecture Entitled "Resuscitate Phage treatment for Cholera: isolation, screening and characterizing potential phages for therapeutic use" in Antimicrobial Resistance Conference (AMRC 2024) under the theme "Exploring the Bio resources of India to Fight against Antimicrobial Resistance (AMR)" at the Sciency City, Kolkata
- Delivered a talk on "A Century of the Influenza Era: Exploring flu Pandemics and the Emergence of Avian Influenza as a global Threat" at ICMR-NIRBI, Kolkata ICMR-NIRBI Scientific Forum on 02/05/2024
- Delivered a lecture as a distinguished invited speaker entitled "Phage Therapy: The Future of Combating Drug Resistant Cholera" in the "5th International Conference on Bacteriophage Research and Antimicrobial Resistance (ICBRAR)" at SPJIMR Auditorium, Bhavan's College Campus Mumbai - 400 058, India Society for Bacteriophage Research and Therapy in Association With Bhavan's Research Center & Bhavan's College, Mumbai 400 058, India from 08/11/2024 to 09/11/2024
- Delivered invited lecture entitled " Role of containment laboratories in the current context" on the 5th Training Workshop on Biosafety and Biosecurity organized by Regional Virus Research and Diagnostic Laboratory (VRDL), ICMR-NIRBI, Kolkata Regional Virus Research and Diagnostic Laboratory (VRDL), ICMR-NIRBI, Kolkata on 16/05/2024
- Attended ICMR-NABL-CDSCO Joint Training Program for Central Medical Device Testing and Calibration Laboratories (CMDTLs) at ICMR-New Delhi ICMR- New Delhi on 29/05/2024

Ph.D. Awarded

Name: Dr. Devendra Nath Tewari
Title of the Thesis: Regulation of Cholesterol Biosynthesis in case of Influenza Virus Infection With Special Emphasis on its Rate Limiting Enzyme HMGCR.
University: University of Calcutta
Date of award: 13.05. 2024

Post and Pre-Doctoral Fellow

Pre-Doctoral Fellow:
Mr. Sanjoy Biswas, SRF
Ms. Debarima Chatterjee, SRF
Ms. Anneshewa Bhattacharya, SRF
Ms. Sampurna Biswas, SRF

A. Majumdar (Principal Investigator), Virology Division

Culture-independent detection of *Chlamydia trachomatis* using LAMP in settings similar to primary healthcare

The study aims to develop a LAMP-based NAAT assay for the detection of *Chlamydia trachomatis* infection. Periodic meetings were held with the investigators from ICMR-NIRBI, Kolkata, and the Institute of Post Graduate Medical Education & Research (SSKM Hospital), Kolkata. Detailed discussions were held to finalise the study protocol, case recruitment forms, sample collection and transport forms, and reporting format. Training materials, study tools, and SOPs for each step have been drafted and finalised to ensure smooth operations. The staff have been recruited, the required instruments have been calibrated as per requirement, and for reagents, the process of procurement is underway. An extensive market survey has been conducted to identify all available real-time PCR-based kits along with their target region for the detection of *Chlamydia trachomatis* and other STIs so that a comparative study can be done. Based on this, one kit has been selected for the detection of *Chlamydia trachomatis*, and another kit for the detection of multiple pathogens causing STIs. Multiple primer sets for LAMP assay have already been designed for ompA and other conserved gene sequences, quality of those primers has already been checked in silico. The primer set is currently under procurement.

Molecular characterization of HIV to detect drug resistant mutations in the population of Eastern part of India

The study aims to identify the different HIV drug resistance mutations among ART naïve and virologic failure PLHIV on first-line and second-line ART along with the prevalent HIV subtypes in the paediatric and adult population of eastern India. A total of 172 cases, have been recruited in the study in the year 2024-2025 till date from the three ART centres of the study and ICMR-NIRBI ICTC. Sequencing has been done for the detection of consensus HIV-drug resistance mutations (DRMs) against any of the four classes of anti-retroviral drugs - nucleoside reverse transcriptase inhibitors (NRTI), non-nucleoside reverse transcriptase inhibitors (NNRTI), and protease inhibitors (PI) in the protease and reverse transcriptase (PR/RT) region and against the Integrase Strand Transfer Inhibitor (INSTI) in the integrase (IN) regions of the HIV-1 pol gene. Sequencing has been completed for 46 samples so far and the rest of the samples are being sequenced. All the sequenced samples have been found to be of predominantly HIV-1 subtype C. In the present study, reported HIV DRMs for NRTI resistance predominantly include M184V, M41L, K65R, M41L, K219E, D67N; Y181C, V106M, Y188C, K101P, K103S, E138R for NNRTI resistance; M41L, L74V, I54M/L, L90M for PI resistance; and for INSTI are R263K, T66A/I, Q148K, E138K, E157Q, G163R/K.

Establishment of a network of Laboratories for managing epidemics and Natural Calamities (VRDL)

The Virus Research and Diagnostic Laboratory (VRDL) at ICMR-NICED is a regional laboratory established in 2015 under the auspice of VRDL Network under the DHR, MOH&FW, with the objectives of creating infrastructure for the timely identification of viruses and agents causing epidemics, developing capacity for identification of novel viruses, developing diagnostic kits, providing training to healthcare professionals, and undertaking research for identification of emerging and re-emerging agents.

Active collaboration exists with VRDLs and Public Health facilities in West Bengal and Sikkim to provide diagnostic, training and research support. A total of 12,739 samples were screened at VRDL for more than 30 viruses and other pathogens of public health importance. A total of 65,427 tests were performed. Research activities are ongoing on molecular characterisation of the respiratory syncytial virus, respiratory adenovirus, acute hepatitis virus, and Influenza. The laboratory also extended support to the different collaborative studies, ICMR coordinated multicentric research programs and vaccine trials.

Pan India Epidemiological, Virological and Genomic Surveillance for Human Influenza and COVID-19 through DHR-ICMR VRDL Network

A referral laboratory has been established at VRDL-NICED under this project and the laboratory is now equipped to initiate isolation, antigenic characterisation, and gene sequencing of Influenza viruses

A total of 1036 severe acute respiratory illness (SARI) and 182 influenza-like illness (ILI) samples were collected from six hospitals and four community settings respectively. 260 paediatric SARI cases have been recruited for RSV surveillance. We have observed a Influenza-A untypable case which was further characterised by the apex lab NIV-Pune and was identified as H9N2. The work was published in IJMR.

Majumdar A, Potdar V, Vipat V, Pawar S, Jadhav S, Choudhary ML, Gaikwad S, Keng S, Tare D, Chatterjee A, Goswami S, Hazra S, Bhardwaj SD, Vijay N, Mukhopadhyay L, Dutta S & Gupta N. Identification & genetic & virological characterisation of a human case of avian influenza A (H9N2) virus from Eastern India. Indian J Med Res 161, March 2025, pp 257-266, DOI: 10.25259/IJMR_1376_2024

Development of a sustainable network of laboratories in India for identification, monitoring and research on virus and bacteria causing acute encephalitis syndrome and other novel pathogens through capacity building in advanced biomedical technologies.

The study focuses on determining the etiological profile (both viral and bacterial) of AES in children and adults admitted to selected hospitals across highly affected regions in India. Further, it emphasises capacity building for exploring novel pathogens associated with AES by Next-Generation Sequencing (NGS).

Upon performing assays through Levels 1 to 4, out of 1022 AES samples collected, 201 samples have been diagnosed with an aetiology. 10% of the AES samples of unknown aetiology reported at ICMR-NIRBI have been subjected to NGS, followed by interpretation of the genomic data to explore the presence of any novel pathogen associated with AES.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

- National Conference on Exploring Bioresources of India to fight against AMR conducted by ICMR-NIRBI from 04/04/2024 to 05/04/2024.

- Dissemination of Climate Change & HIV Report and Research Brief conducted by ICMR- NIRBI & UNDP on 22/04/2024
- WHO 4th Meeting of Performance Evaluation Laboratories at Geneva, Switzerland conducted by WHO, Geneva from 21/05/2024 to 23/05/2024
- Capacity Building on Systematic Review and Meta-analysis conducted by WHO-India & ICMR-NIRBI from 05/08/2024 to 09/08/2024
- Genomics Analysis & Technology Conference 2024 conducted by GATC from 24/08/2024 to 25/08/2024
- ISO 15189:2022 transition and documentation conducted by NACO 27/01/2025 to 29/01/2025
- Hands-on training on Mpox Genome Sequencing conducted by ICMR-NIV from 10/02/2025 to 14/02/2025
- NACO's North East Regional Consultation Meeting conducted by NACO on 08/03/2025
- Experience Sharing, Review and Training (ESRT) for NACP and Non-NACP Viral Load and EID Labs conducted by NACO from 11/03/2025 to 12/03/2025
- State Level NACP 360-degree NACP Review Meeting conducted by WBSAP&CS on 13/03/2025
- HIV-1 Viral Load testing using the Roche COBAS 8800 conducted by Roche & NACO-SHARE INDIA from 23/04/2024 to 25/04/2024
- Regional Training of Trainers of HSS ANC and Prison conducted by NACO & ICMR-NIRBI from 04/11/2024 to 06/11/2024

N. Chakrabarti (Principal Investigator), Virus Laboratory

In-silico analysis of antiviral responses from ethnomedicinal compounds against Human cytomegalovirus

Objective:

- Discover new therapeutic approaches by using different medicinal mushrooms and decipher the mode of action of the suitable bioactive compounds against HCMV infection *in vitro* conditions
- Decipher the probable mode action of the selective bioactive compounds against clinical HCMV isolates by *in silico* method.

Outcome:

Human cytomegalovirus (HCMV) is a common herpesvirus that can severely affect transplant recipients, those with AIDS, and newborns. Existing synthetic medications face limitations, including toxicity, processing issues, and viral resistance. As part of this study, the efficacy of the extracellular enzyme laccase isolated from a widely available mushroom (*Pleurotus pulmonarius*) was compared to that of ganciclovir, a common antiviral, used against HCMV.(Fig 10) The study found that laccase can synergistically inhibit HCMV replication by targeting new inhibitory sites on the UL54 protein (Fig 11). Viral replication requires significant energy, increasing cellular respiration. The antiviral effect of laccase was linked to reduced expression of genes regulating cellular respiration, which coincided with decreased viral DNA copies (Fig 12). Additionally, *in silico* analysis has identified a novel binding site for the laccase enzyme in the C-terminal region of HCMV DNA polymerase specifically between amino acids 1004 and 1242, which effectively obstructs the binding of the essential viral replication regulatory accessory protein UL44, thereby hindering successful replication (Fig 13). Molecular dynamics simulations were performed under standardized conditions mimicking a cellular environment, revealing a stable protein-protein docking complex (Fig 14). This study may aid in developing novel antiviral strategies by utilizing laccase's target specificity to regulate host cellular pathways against Herpesviridae.

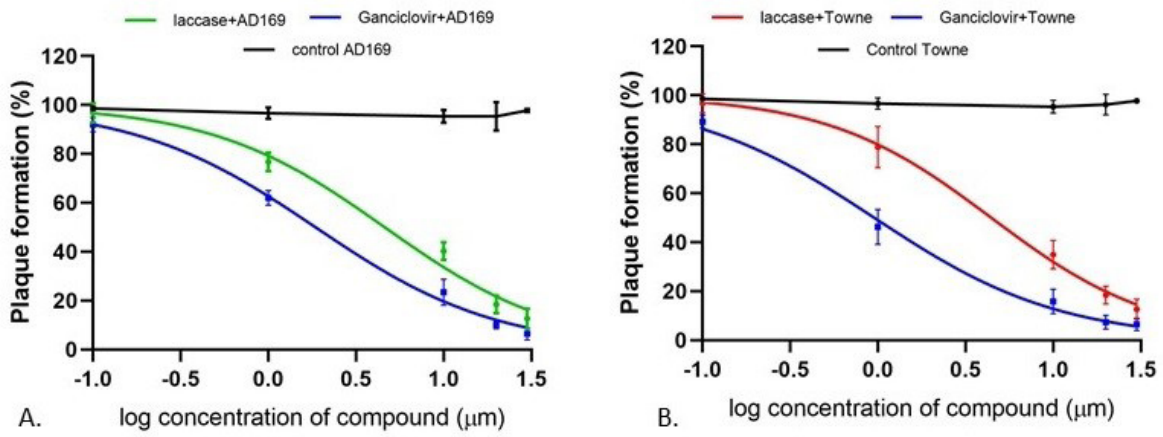


Fig 10: antiviral efficacy of tested drugs-laccase enzyme (4-12 µM concentration) and positive control drug ganciclovir (0.6-2.4 µM) is represented by log concentration on both AD169 and Towne strains. Data represented by triplicated mean+SD

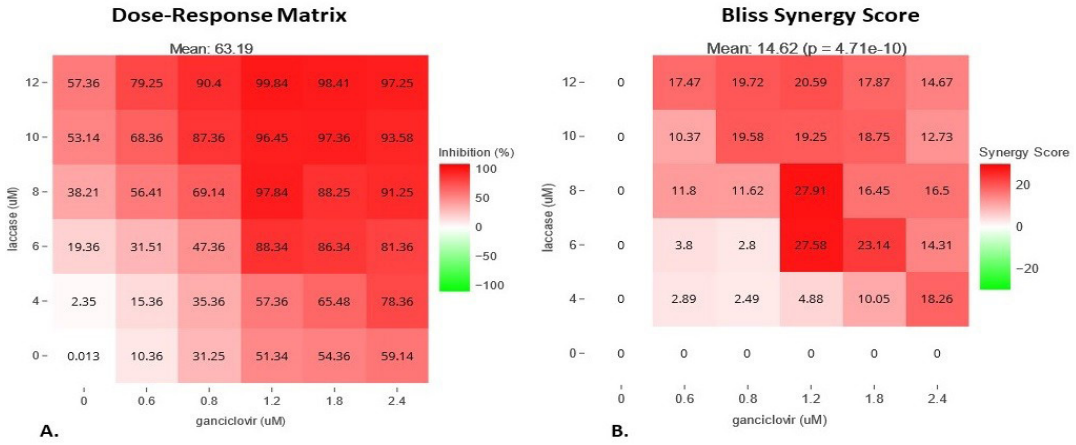
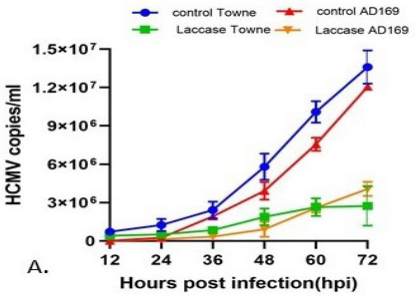


Fig 11: positive combinational effect (synergy) of laccase enzyme and ganciclovir- [A] dose-responsive matrix on variable concentration of test compounds were measured as % of drug efficacy. [B] Bliss algorithm score pattern of both the drugs to understand the synergistic relationship.



B.

Rate of Replication				
	Base pair/min			
Hours post infection	AD169		Towne	
	Control	Laccase	Control	Laccase
12-36 hpi	~86	~55	~116	~52
36-48 hpi	~226	~132	~248	~68
48-60 hpi	~313	~105	~423	~106
60-72 hpi	~363	~128	~419	~114

Fig 12: Replication rate of the virus and cellular respiratory transcript impacted due to alteration by tested enzyme- [A] viral copies of the AD169 and Towne treated cells treated with the presence of EC50 dose of enzyme and observed the impact on different post infection time frame (12-72 hpi). [B] The rate of replication observes within each successive intermediate time frame, represented by the synthesizing base pair growth rate per min.

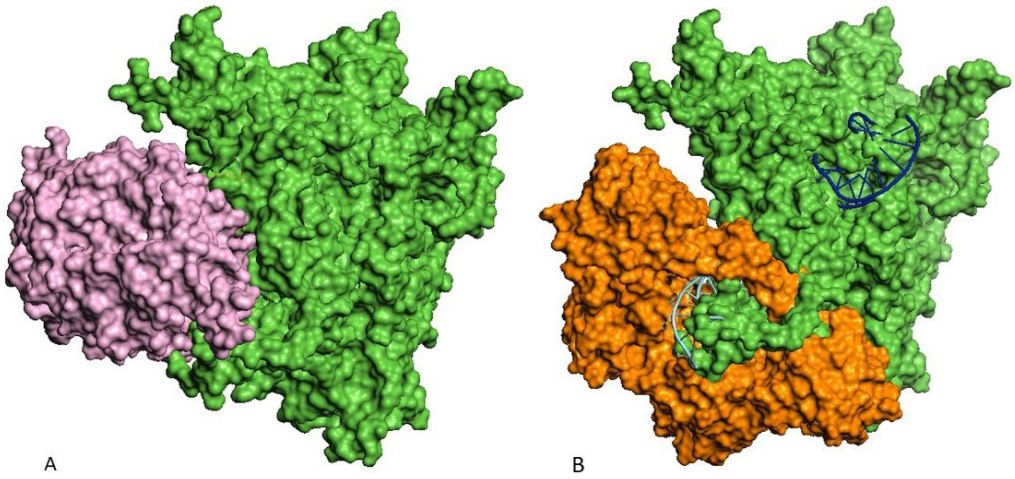


Fig 13: Superimposition of HCMV DNA polymerase with template structures: [A] HCMV DNA polymerase (green) is superimposed on DNA polymerase δ of Saccharomyces cerevisiae (PDB ID-3IAY) (in orange). [B] cartoon representation of HCMV DNA polymerase where the DNA entered(brown) within the replication cleft along with exiting DNA (blue) portion

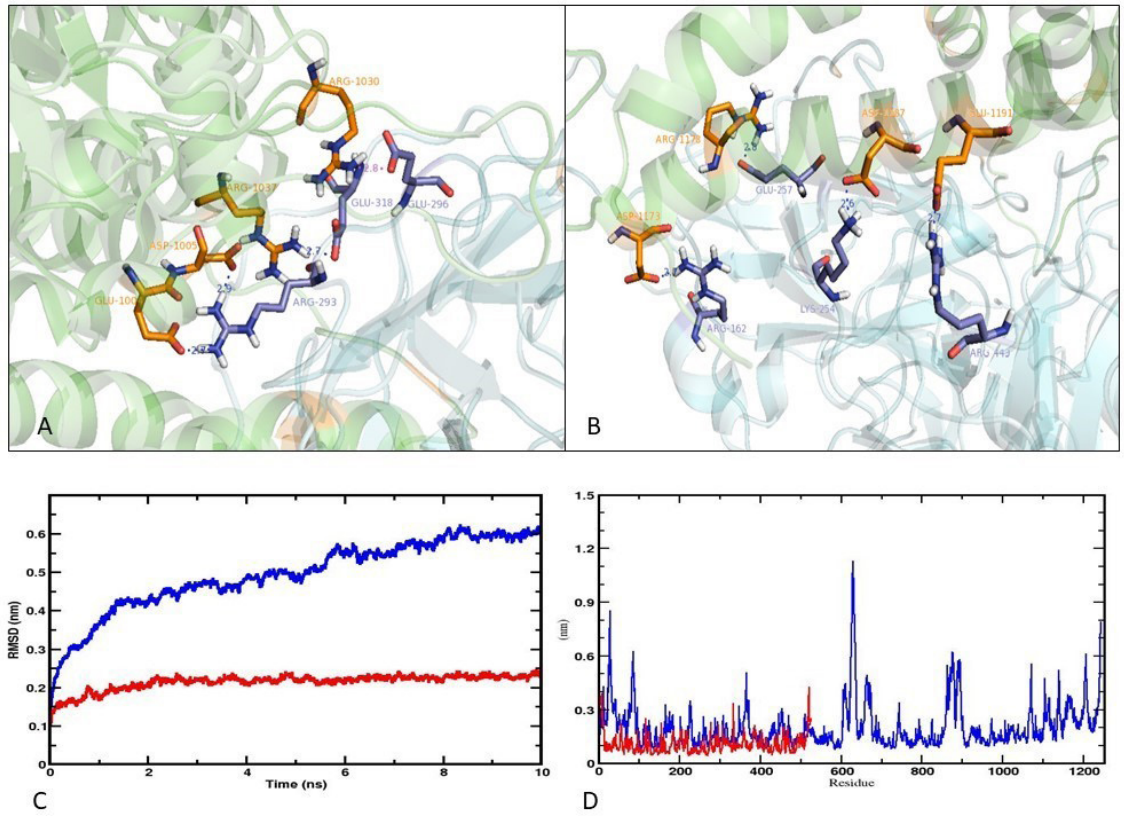


Fig 14: Protein-protein docking and dynamics simulation result of antiviral enzyme with the specific target sites of HCMV UL54 (DNA polymerase). Amino acid residues on HCMV DNA polymerase (green) marked in orange are bounded with amino acids of Laccase (Cyan) marked in blue. [A] Residues from 1004-1037 [B]Residues from 1173-1191 on HCMV DNA polymerase. [C] RMSD plot and [D] RMSF plot of. HCMV DNA polymerase (Blue) and Laccase (red)

Detection and differentiation of antinuclear antibodies in serum of dengue suspected patients with or without systemic autoimmune disease

Objective:

• Understand the clinical variability and progression of Dengue infection for better diagnostic approaches.

Outcome:

The pathophysiology of dengue may be influenced by antibodies released during infection. Several autoimmune diseases are accompanied by antinuclear antibodies (ANAs) but 8–10% of the general population have positive ANA tests. To test the hypothesis that an ANA-positive test indicates an immune dysregulated state that modifies the risk for certain clinical disorders in people with or without an autoimmune disease, we examined the various ANA profiles and their relationships to various autoimmune disorders, as well as the severity of these relationships, in patients infected with dengue fever. Enzyme-linked immunosorbent assay (ELISA) and reverse transcription-polymerase chain reaction (RT-PCR) methods were used. Indirect immunofluorescence assay (IIFA) and line immunoassay (LIA) were performed to detect and differentiate the ANAs among dengue infected

patients. Out of 135 dengue virus-positive patients, 94.07% were positive by ELISA and 5.93% positive by RT-PCR method. ANAs by IIFA and LIA were detected in 54.8% and 18.5% of the dengue positive patients, respectively, and 10.3% and 7.1% of the 126 dengue negative patients, respectively. This study showed that dengue was associated with an increased risk of autoimmune myositis and mixed connective tissue disease (MCTD), a rare complication of dengue. The risk of other autoimmune diseases did not seem to increase after DENV infection.

Post and Pre-doctoral Fellows

Pre-Doctoral Fellow:
Mr. Sabbir Ansari (DST-SRF- Thesis submitted),
Mr. Rajendra Prasad Chatterjee. (DBT-SRF- Thesis submitted).

P. C. Sadhukhan (Principal Investigator), Virus Laboratory

HCV drug resistance and Direct Acting Antivirals non-response studies among hosts using Multi-omics approaches

A multi-omics approach was employed to explore host factors influencing HCV treatment outcomes. Among 310 HCV sero-reactive patients screened, HCV RNA was detected in 45% of β-thalassemia, 35% of CKD, and 52% of general population cases. Despite treatment, 26% of CKD and general population patients remained RNA-positive, indicating non-response to direct-acting antivirals (DAAs). Transcriptomic and proteomic profiling of six HCV RNA-positive patients (before and one month after initiation of DAAs therapy) and healthy controls revealed several key molecular changes. Transcriptomics highlighted altered gene expression in immune regulation, metabolism, and structural remodeling. Notably, ITGB8, ALOX15, and PLA2G2C were linked to inflammation, while PMEL and SIGLEC8 related to vesicle trafficking. Long non-coding RNAs like FZD8, TPP1, and PRR7-AS1 were involved in signaling and protein degradation. SWATH-MS analysis of plasma from the same set of samples used for transcriptomic analysis, quantified 323 proteins at a 1% peptide false discovery rate (FDR). Gene set enrichment analysis (GSEA) exhibited extracellular matrix organization and innate immune system as enriched pathways. Based on transcriptomic analysis, key genes involved in secretory pathways, immune response, and signaling were identified. These genes suggest alterations in extracellular matrix remodeling, immune activation, and angiogenic signaling. Accordingly, from proteomics data, proteins such as Hyaluronan Binding Protein 2 and Serum Hyaluronan-Associated Protein were selected to reflect ECM changes, while Leucine-Rich Alpha-2 Glycoprotein aligns with innate immune activation. Signaling molecules VEGF, FGF, TGF-β, and IL6 were chosen to capture downstream effects of transcriptional changes related to inflammation and angiogenesis.

Pan-India antigenic characterization of dengue viruses

This multicentric study, funded under the ICMR PM-ABHIM initiative, aims to serve as an early warning system for a potential dengue pandemic by analyzing the antigenic and genomic characteristics of dengue viruses circulating across India. As the Principal Investigator, the study led efforts to develop a spatio-temporal antigenic map and examine the evolutionary trajectory of dengue viruses.

During the first year, over 1100 suspected dengue cases were screened (≤5 days of fever) among outdoor patients in ID & BG hospital, Kolkata, and 85 NS1-seropositive patient's blood samples were collected. Whole genome sequencing was successfully performed on 55 out of 85 fresh samples and 136 archived NS1 seropositive samples (2016–2023) using Illumina-based Next-Generation Sequencing. A new serotype specific multiplex RT-PCR system has developed in-house to amplify dengue virus whole genome, with significant IPR potential. This is a two tube (Pool A and Pool B) one-step multiplex RT-PCR system that can amplify dengue whole genome (nt17 to nt10,700) and the amplicon size is ~400bp (Fig.-15). The PCR amplicons can be sequenced both in Illumina and Nanopore based NGS. Envelope gene mutational analysis of DENV3 revealed multiple mutations conferring to surface exposure, host-virus interaction and immune evasion across the envelope protein domains (ED I, ED II, ED III and stem region). Comparative epitope analysis evaluating B cell, MHC-I and MHC-II epitopes against vaccine strains (DENGVAXIA, TV003 and TAK003) suggests possible indicator of antigenic variability with potential vaccine-induced immunity implication. These revelations underscore the urgency for continued genomic surveillance to keep track of antigenic drift, test vaccine compatibility, and illuminate developing immune evasion strategies.

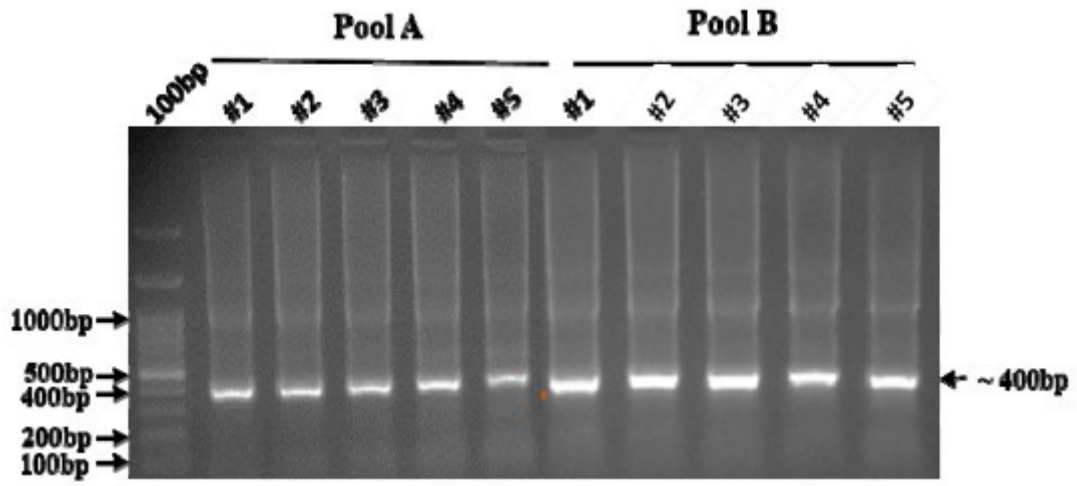


Fig 15: PCR amplification of Dengue virus serotype 3 whole genome in two pool (A+B) by one step multiplex RT-PCR

Development of HCV Antigen-Based Early Detection System

HCV infection is among the most common transfusion and intravenous-transmitted infections in humans. Considering the current challenges as mentioned in global hepatitis report, a rapid, low cost and efficient detection system alternative to NAT is useful in resource limited settings to increase the diagnosis of HCV to support WHO elimination programme by 2030. The study successfully developed a rapid, one-step nanoparticles aptamer-based detection system for HCV antigen. Spectroscopic analysis confirmed aptamer-protein interactions, with a consistent secondary UV peak at 410 nm supporting the detection mechanism. Validation using 150 positive clinical samples showed uniform results, and a quality control study confirmed the nanoparticles-aptamer stability for over six months. Compared to the standard commercially available HCV antigen detection ELISA kit, the new system significantly reduced detection time from 4 hours to just 30 minutes while maintaining comparable accuracy and sensitivity. It demonstrated reliable performance across serum samples with varying viral loads and genotypes, indicating its broad applicability and non-genotype specificity. ICMR has been filed a patent for this new detection system.

Patent(s) filed/accepted /technology developed

The title of the patent: "Development of HCV antigen-based early detection system". with provisional patent application No. 202411050707, dated 09-12-2024.

Conferences / Seminars /Workshops / Meetings / Trainings Attended

Conferences

- Attended Conference on "Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR) conducted by India Institute of Bioresources and Sustainable Development (IBSD) and ICMR-NIRBI in association with Society for Ethnopharmacology (SFE) from April 4-5, 2024.

Training

- Attended Training on "Mental Health Awareness Workshop" conducted by ICMR-Hqr., The Division of Descriptive Research on Oct 17, 2024.
- Delivered talk at 1st Investigators workshop of "Pan-India antigenic characterization of dengue viruses: Early warning signal for a potential pandemic" conducted by ICMR-NIRBI, Kolkata on July 2nd, 2024.
- Delivered talk at 2nd Investigators Workshop of "Pan-India antigenic characterization of dengue viruses: Early warning signal for a potential pandemic. Organized by ICMR-NIIRNCD, Jodhpur, Oct 24-25, 2025

Seminars

- Molecular Mechanisms in Assembly of HIV- 1 Particles ICMR-NIRBI, Kolkata. Feb 20, 2025
- Journey of a Kinase from signaling to a drug target in Cancer ICMR-NIRBI, Kolkata Jan 9, 2025
- World AMR Awareness Week (WAAW) ICMR-NIRBI, Kolkata Nov 22, 2024
- Fatty Liver – Is it a Matter of Concern? ICMR-NIRBI, Kolkata Oct 24, 2024
- 2nd Investigators meeting of "Pan-India antigenic characterization of dengue viruses: Early warning signal for a potential pandemic" ICMR-NIIRNCD, Jodhpur Oct 24-25, 2024
- 1st Investigators meeting of "Pan-India antigenic characterization of dengue viruses: Early warning signal for a potential pandemic" ICMR-NIRBI, Kolkata July 2, 2024
- Cellular Control of Epstein Barr virus Lytic Cycle Replication ICMR-NIRBI, Kolkata June 20, 2024
- Access to affordable medicine and promotion of Rational Therapeutics ICMR-NIRBI, Kolkata May 21, 2024

Ph.D. Awarded

Name: Dr. Priya Kumari Verma
Title of the Thesis: Studies on biomolecules associated with vascular dysfunction in Dengue Haemorrhagic Fever/ Dengue Shock Syndrome.
University: Jadavpur University, Kolkata
Date of award: 05.12.2024

Name: Dr. Supradip Dutta
Title of the Thesis: Studies on hepatitis C virus non-structural gene 3 mutations and HCV host pathogenesis
University: Jadavpur University, Kolkata
Date of award: 10.01.2025

Post and Pre-Doctoral Fellow

Post-Doctoral Fellow
Dr. Uttaran Bhattacharya (Project RA)
Dr. Moumita Majumdar (ICMR RA, Individual Fellowship)

Pre-Doctoral Fellow
Dr. Supradip Dutta, SRF-Project
Dr. Priya Kumari Verma, SRF-UGC
Ms. Upasana Baskey, SRF-UGC
Mr. Sagnik Bakshi, SRF-ICMR
Ms. Raina Das, SRF-Project
Ms. Shreyasi Nath, SRF-CSIR
Ms. Anwesha Ghosh, SRF-UGC

NABL Accreditation

ICMR-NIRBI provide quality medical laboratory service to comply with ISO 15189:2012 standards all time. The scope has been expanded with 28 analytes from bacteriology, parasitology, virology and VRDL division in the discipline of Microbiology and Infectious Disease Serology and Molecular Testing of NABL. This year, all the divisions have successfully completed "Desktop Surveillance" and "Unannounced assessment" conducted by NABL in accordance with ISO 15189:2012.

National Accreditation Board for Testing and Calibration Laboratories

NABL

CERTIFICATE OF ACCREDITATION

ICMR-NATIONAL INSTITUTE FOR RESEARCH IN BACTERIAL INFECTIONS

has been assessed and accredited in accordance with the standard

ISO 15189:2012

"Medical laboratories - Requirements for quality and competence"

for its facilities at

P-33, C.I.T ROAD, SCHEME-XM, BELIAGHATA, ICMR-NICED, NEW BUILDING, ID & BG HOSPITAL CAMPUS, KOLKATA, WEST BENGAL, INDIA

in the field of

Medical Testing

Certificate Number: MC-6830

Issue Date: 13/09/2024 Valid Until: 12/02/2026

This certificate supersedes the Certificate No. MC-6327 with issue date 13/02/2024 in view of change in name of the laboratory.

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of thislaboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Entity: ICMR-National Institute of Cholera and Enteric Diseases

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

Table 1 : Diagnostic services of Regional VRDL:

Pathogen/Disease	Parameter Tested	Principle of Test
Dengue	Dengue NS1 Antigen Dengue IgM Antibody Dengue IgG Antibody	ELISA
Chikungunya	Chikungunya IgM Antibody Chikungunya viral RNA	ELISA Real Time PCR PCR
Zika	Zika viral RNA	Real Time PCR PCR
Japanese Encephalitis	Japanese encephalitis IgM Antibody	ELISA
Hepatitis	Hepatitis A virus IgM Antibody Hepatitis E virus IgM Antibody Anti-Hepatitis C virus Antibody HBsAg	ELISA
Influenza	Influenza A viral RNA Influenza A - H1N1 viral RNA	Real Time PCR

Pathogen/Disease	Parameter Tested	Principle of Test
Influenza	Influenza A - H3N2 viral RNA Influenza B viral RNA Influenza B - Yamagata viral RNA Influenza B - Victoria viral RNA	Real Time PCR
COVID-19	SARS-CoV-2	Real Time PCR
Other Respiratory Viruses	Respiratory syncitial virus - A RNA Respiratory syncitial virus - B RNA Human metapneumovirus - A1A2 RNA Human parainfluenza virus - 1 RNA Human parainfluenza virus - 2 RNA Human parainfluenza virus - 3 RNA Human parainfluenza virus - 4 RNA Respiratory adenovirus DNA Rhinovirus	Real Time PCR
Mumps	Mumps IgM Antibody	ELISA
Measles	Measles IgM Antibody	ELISA
Rubella	Rubella IgM Antibody Rubella IgG Antibody	ELISA
Varicella Zoster	Varicella zoster IgM Antibody	ELISA
Cytomegalovirus	Cytomegalovirus IgM Antibody	ELISA
Enteric Viruses	Rotavirus Antigen Adenovirus viral DNA	ELISA ELISA
Scrub Typhus	Scrub typhus DNA Scrub typhus IgM Antibody	Real Time PCR ELISA
Leptospira	Leptospira DNA Leptospira IgM Antibody	Real Time PCR ELISA

Enhancing Infectious Disease Diagnosis Quality: External Quality Assurance Program for Hep A, E serology

The EQAP for Infectious Disease Diagnosis aims to develop indigenous PT panels, designate nodal labs, and ensure accurate, reliable diagnostics to support national surveillance and improve laboratory proficiency. It also promotes adherence to international standards and continuous improvement in diagnostic practices. A secondary goal is to build capacity by training additional VRDLs as PT panel providers. In the first year of the project, a well-defined sample bank was established comprising clinical specimens, following approval from the Institutional Ethics Committees. SOPs were developed to create standardised Proficiency Testing (PT) panels for Hep A,E serological testing. Initial panels included five samples targeting both analytes with clear positive/negative results. Over time, these will evolve into complex, multi-analyte panels to assess reproducibility, repeatability, and cross-contamination. Each panel were fully validated and characterised, assigning both qualitative and quantitative values (OD values). Standardised,

blinded PT panels were distributed to 11 labs in the pilot phase via temperature-controlled courier services, with verification of proper storage during transit. The rollout will scale from 50 laboratories in the first year to 200 by the third year. Participating labs analysed the PT panels using their routine protocols and submitted results within 15 working days. Data were collected and analysed to assess laboratory performance, identify gaps, and highlight areas of excellence. Continuous monitoring will be conducted through the web portal, with performance scores defined by an expert group.

Consortium of NRLs for Kit Quality

The evaluation of diagnostic kits for transfusion transmitted infections, before using in field, is an important aspect of obtaining good quality kits. In this direction, a robust mechanism has been developed by Consortium of National Reference Labs following the uniform procedure countrywide to evaluate performance of commercial kits. Being a member of Consortium labs, ICMR-NIRBI is engaged in Quality assurance of HIV, HBV & HCV diagnostic kit, which is routed through Consortium secretariat, ICMR-NARI, Pune.

- Consortium Laboratory, ICMR-NIRBI conducted evaluation of HIV, HBV & HCV diagnostic kits to ensure the quality as per CDSCO guidelines.
- Harmonization in the workflow of Consortium Laboratory, ICMR-NIRBI, ensures to obtain good quality diagnostic kits in the field as a public health importance.

Table 2: Kit Evaluation by Consortium of NRLs, ICMR-NIRBI, Kolkata (April 2024 to March 2025):

Type of Kit Evaluated	No. of Kit/Batch Received	No. of Kit/Batch Accepted and Evaluated	Total no. of batches complying with specifications of CDSCO
HIV RAPID	18	18	16
HIV & SYPHILIS DUAL RAPID	06	06	06
TOTAL	24	24	22

Pattern of assistance for Apex, NRLS and SRLS under the External Quality Assessment Scheme (EQAS) of NACO

External Quality Assurance Scheme is one of the important tools to assess the performance of the laboratory and their ability to generate accurate results. National Reference Laboratory of ICMR-NIRBI is the proficiency testing provider for HIV antibody testing for the States Reference Labs (SRLs) of A&N, Assam, Jharkhand, Meghalaya, Mizoram and Orissa.

Referral Services: National Reference Lab, NIRBI has been entrusted with the responsibility of verifying results for samples sent by Hospitals. Samples tested, result communicated within the turnaround time, analysed the root cause of discordance and trained the referring lab personnel for improvement and technical building. Most of the samples are positive for HIV antibody indicating improvement of quality of the referring labs. (Table 3 & 4)

Table 3: HIV Sentinel Surveillance 2025 (ANC and Prison): NRL, ICMR-NIRBI (Testing Lab), Kolkata (sample received and tested from Jan 2025 to March 2025)

Name of the site (Type)	Site code with subsite	Sample received	HIV	Syphilis	Hepatitis B	Hepatits C
			Tested	Tested	Tested	Tested
Abinash Dutta Maternity Home (ANC)	19335012-0	402	128	168	168	168
Jangipur Sub-Divisional Hospital (ANC)	19325021-0	400	128	161	161	161
Nabadwip State General Hospital (ANC)	19328011-0	400	125	194	194	194
Vidyasagar State General Hospital (ANC)	19335021-0	402	112	147	166	166
Aranghata BPHC (ANC)	19328018-1	203	58	62	62	62
Ranaghat Sub-Divisional Hospital (ANC)	19328012-2	200	49	49	49	49
Barasat MCH (ANC)	19329021-0	400	151	180	201	201
Berhampore Central Correction Home (Prison)	19325131-0	385	180	180	180	180

Table 4: HIV Sentinel Surveillance 2025 (ILC): NRL, ICMR-NIRBI (Testing Lab.), Kolkata (Sample received and tested from Jan 2025 to March 2025).

Testing Lab	No. of Samples received	No. of samples tested	No. of samples rejected
Pasteur Institute, Shillong	341	0	0
GMCH, Guwahati	159	0	0
AMCH, Dibrugarh	129	0	0

Table 5: HIV Sentinel Surveillance 2024 (IBBS): NRL, ICMR-NIRBI (Testing Lab.), Kolkata.

State	Received	Rejected	Tested	HIV Reactive	SYPHILIS Reactive
West Bengal	3657	01	3656	258	771 (Out of 2522)
Mizoram	1422	01	1421	450	131 (Out of 880)

Table 6: HIV Sentinel Surveillance 2024 (HRG): NRL, ICMR-NIRBI (Testing Lab.), Kolkata.

State	Received	Rejected	Tested	HIV Reactive
Meghalaya	1935	6	1929	87
Mizoram	3492	11	3481	531
Chhattisgarh	4238	8	4230	83
Tripura	2252	2	2250	462
Nagaland	3998	9	3989	67

Proficiency Testing Program:

Proficiency testing program for NRLs conducted by Apex Lab (NITVAR, Pune): NACO-National Reference Laboratory of ICMR-NIRBI participated in the proficiency testing program conducted by Apex Laboratory, ICMR-NITVAR, Pune twice in a year.
Proficiency testing program for SRLs and their attached ICTCs: NACO- National Reference Laboratory of ICMR-NIRBI conducted "Proficiency Testing Programme" for 12 State Reference Laboratory and their attached ICTCs. Collection of samples, preparation, characterization and validation of panel is the steps to be followed for whole activity.

Integrated Counseling & Testing Centre (ICTC)

Integrated Counselling & Testing Centre (ICTC), currently known as HIV Counselling and Testing Services (HCTS) is key entry point to prevention, treatment and care of HIV and related infections. It continues to envisage the provision of comprehensive services in an integrated manner. HCTS comprises of counselling (pre-test counselling, informed consent and post-test counselling); testing and prompt delivery of test results with embedded quality assurance; ensuring audio-visual privacy and confidentiality; also linkages to appropriate HIV prevention, care, support and treatment services after meticulously following "5Cs" viz. Consent, Confidentiality, Counselling, Correct test results and Connection.

The main functions of the ICTC include:

- Conducting HIV diagnostic test.
- Conducting VDRL test to High Risk Groups (HRG).
- Conducting HbsAg, HCV tests when required.
- Providing basic information & education on modes of transmission and prevention to promote healthy behavioral change and reduce vulnerability.
- Providing psycho-social support to HIV positive clients.
- Link HIV positive clients with other HIV prevention, care treatment services.
- Providing risk reduction counseling to clients who found HIV negative.
- Follow-up counseling and testing.
- PEP distribution if required.
- Free condom distribution.
- Cross referrals to NTEP, STI, ART, TI-NGOs etc.
- Participated in outreach activities to monitor Community Based Screening (CBS).

- Participated in discussion on HIV screening, HIV confirmation and target group for screening of CSC staff as resource person.

Table 7: HIV testing details at ICTC, ICMR-NIRBI (April 2024- March 2025)

Total Tested	Positive	Positivity	HIV-TB Co-infection	Client Initiated Tested	Provider Initiated Tested
1340	35	2.49%	4	746	594

Table 8: HBSAg, HCV, VDRL testing details in ICTC, ICMR-NIRBI (April 2024-March 2025)

Tests	HbsAg	Tests	Tests
Total Tested	431	431	20
Total Positive	03	08	05

A high standard of testing is maintained at ICTC by using 3 test principles for diagnosing HIV. ICMR-NIRBI ICTC secured 100% concordance result in external quality assurance scheme (EQAS) through State Reference Laboratory.

From April 2024 to March 2025 total 1340 clients were tested for HIV in ICTC. Among them 35 were found positive (Table 7). All the HIV positive clients were linked to ART center, STI clinics and NTEP for further treatment and care. HIV negative clients were also linked to STI center and NTEP if required.

Certificate of Excellence

ICTC of ICMR-NIRBI has achieved 5-star quality of Standard by maintaining consistently high standard of quality in HIV testing as per the evaluation of National AIDS Control Organization.

Plasma Viral Load Assay of HIV

HIV Viral load assay under NACO, is being conducted at ICMR-NIRBI – Molecular HIV Laboratory, for ensuring efficacy of ART and taking evidence-based decision for initiation of further treatment. Quantitative measurement of HIV level in peripheral blood has greatly contributed to the understanding of the pathogenesis of HIV infection and has been shown to be an essential parameter in prognosis and management of HIV infected individuals. Decisions regarding initiation or changes in antiretroviral therapy are guided by monitoring plasma HIV RNA levels

(viral load). The goal of antiretroviral therapy is to reduce the HIV virus in plasma to below detectable levels (below 1000 copies/ml of plasma which corresponds to a viral suppression and efficacy of the antiretroviral therapy).

ICMR-NIRBI is one of the Laboratories under NACO that uses Abbott RealTime HIV-1 RNA assay, which is an in vitro reverse transcription polymerase chain reaction (RT-PCR) assay for the quantization of HIV-1 in human plasma. ICMR-NICED Molecular HIV laboratory restarted HIV viral load assay for the patients under ART for monitoring effectiveness of on-going treatment as per national guidelines and also to assist in HIV drug resistance mutation assay.

Presently 14 ART centers (ARTC–Darjeeling, ARTC–Shiliguri, ARTC-Coochbihar, ARTC – Islampur, ARTC -Murshidabad, ARTC Maldah, ARTC-Bankura, ART-Nadia, ARTC-Hooghly, ARTC-Tamluk, ARTC-SSKM, ARTC-STM, ARTC-MR Bangur and ARTC-Sagar Dutta Medical College) of West Bengal are sending specimens to ICMR-NIRBI for HIV Viral Load test. Apart from these centres the Centre of Excellence at STM (West Bengal) is also sending specimens of PLHIV who are under SACEP review. Two ARTCs from Arunachal Pradesh (FI-Namsai and ARTC-Naharlagun) are also linked with us for PVL testing. For the period of April 1st, 2024 to March 31st , 2025; 32,826 of Viral Load samples were received at ICMR-NIRBI, and a total of 35062* samples were tested for HIV viral load during the particular period (Table 9). In this period total 96.36% of viral suppression was observed (considering the TND and copy no<1000/ml viral load results) (Fig 1).

Table 9: Status of HIV Viral Load Assay for patients under ART for the period of April 1st, 2024 to March 31st , 2025

No. of Samples		HIV-1 Viral Load Copy No. <1000 copies/ ml of plasma	HIV-1 Viral Load Copy No. >1000 copies/ ml of plasma	HIV-1 Viral Load TARGET NOT DETECTED
Received	Tested			
32826	35062*	6233	1275	27554

***Samples from March 2024 were tested in the current financial year due to a machine breakdown during that period.**

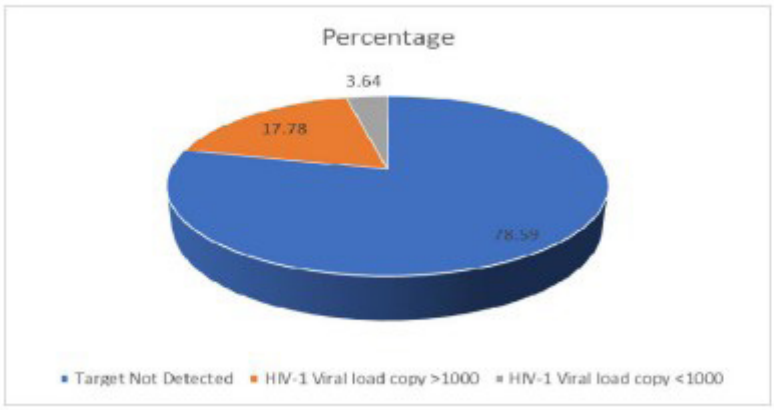


Fig 1: ***Representation HIV plasma viral load results in the period of April, 2024-March, 2025.***

Participation in Proficiency Program:

Viral Load Testing Laboratory successfully participated in the proficiency Testing program under External Quality Assurance Scheme conducted by ICMR-NITVAR, Pune for HIV-1 Viral Load using Dried Tube Specimens (DTS) in 2024—Round I (04 July 2024) and Round II (20 December 2024) for the Abbott platform, and Round II (20 December 2024) for the COBAS platform.

Early Infant Diagnosis (EID)

Molecular diagnosis of HIV among babies (up to 18 months) born to HIV infected mothers is being done at ICMR-NIRBI Regional Reference Lab (RRL), using Dried Blood Spot (DBS) samples, employing state-of-art molecular assay for 14 states of East and North-Eastern India. From June,24 onwards we were delinked with 6 North-Eastern states Mizoram, Assam, Manipur, Nagaland, Nagaland and Tripura now we are dealing with 8 states of East and North-Eastern India. The aim of this National Program is to ensure early initiation of ART for the infected babies and also to monitor effectiveness of current practice of PPTCT (Prevention of Parent to Child Transmission).

NACO-conducted EID Program is the cornerstone in the efforts to significantly reduce HIV related morbidity and mortality in infants. The diagnosis of HIV infection in infants and children younger than 18 months is different from that in adults due to trans-placental transfer of maternal antibodies from mother to child during pregnancy, childbirth and breast feeding. Hence, HIV-1 TNA (Total Nucleic Acid) PCR testing is recommended for the babies less than 18 months of age. ICMR - National Institute for Research in Bacterial Infections (NIRBI) is one of the 8 Regional Reference Laboratories (RRL) among AIIMS, ICMR-NIRBI, NITR, Mumbai Kasturba Hospital, NIMHANS, NITVER, ACSR Govt Medical College SPSR Nellore & NHAK Kohima under NACO, performing Real-time HIV-1 Qualitative in vitro amplification assay for the qualitative detection of Human Immunodeficiency Virus Type 1 (HIV-1) nucleic acids from Dried Blood Spot (DBS) samples. In ICMR-NIRBI, EID program has been started from August, 2010 initially with three states, West Bengal, Orissa and Chhattisgarh. With gradual success of the program, the North Eastern states (Jharkhand, Bihar, Assam, Manipur, Mizoram, Nagaland, Meghalaya, Arunachal Pradesh, Sikkim, Tripura, and Andaman & Nicobar Islands) were also included under ICMR-NIRBI-RRL (Molecular HIV Laboratory).

Presently, more than 1000 ICTCs are involved in collection of DBS samples in 8 states under NIRBI-RRL for DBS HIV-1 PCR. A National Testing Algorithm comprising of two sections according to the age group of the child (Algorithm A: for infants < 6 months and Algorithm B: for child 6-18 months) have been followed for HIV exposed infants in this EID program for detection of HIV-1 DNA. All DBS HIV-1 PCR reactive/detected specimens are further confirmed by a 2nd Confirmatory HIV-1 PCR of the same sample.

A total of 3496 DBS samples were received from April 2024 to March 2025 at ICMR-NIRBI-Regional Reference Laboratory Molecular HIV Lab. A total of 3305 DBS samples were tested for the period of 01.04.2024 to 31.03.2025 (The number of samples received and tested in a month may not tally due to previous pending samples) and their status is depicted below

Table 10 : Status of EID DBS Sample Received and Tested (with Positivity of HIV-1) at ICMR-NIRBI from the period April 2024 to March 2025

Name of States	No. of DBS Samples Received	No. of DBS Samples Tested	No. of HIV-1 DNA Detected DBS Samples
West Bengal	674	687	28
Odisha	442	418	33
Chhattisgarh	641	584	14
Bihar	1039	934	66
Jharkhand	251	257	25
Mizoram	118	82	01
Assam	64	94	06
Manipur	24	19	01
Nagaland	90	103	07
Meghalaya	103	79	04
Arunachal Pradesh	21	21	03
Sikkim	04	04	00
Tripura	18	16	04
A & N Islands	07	07	00
TOTAL	3496	3305	192

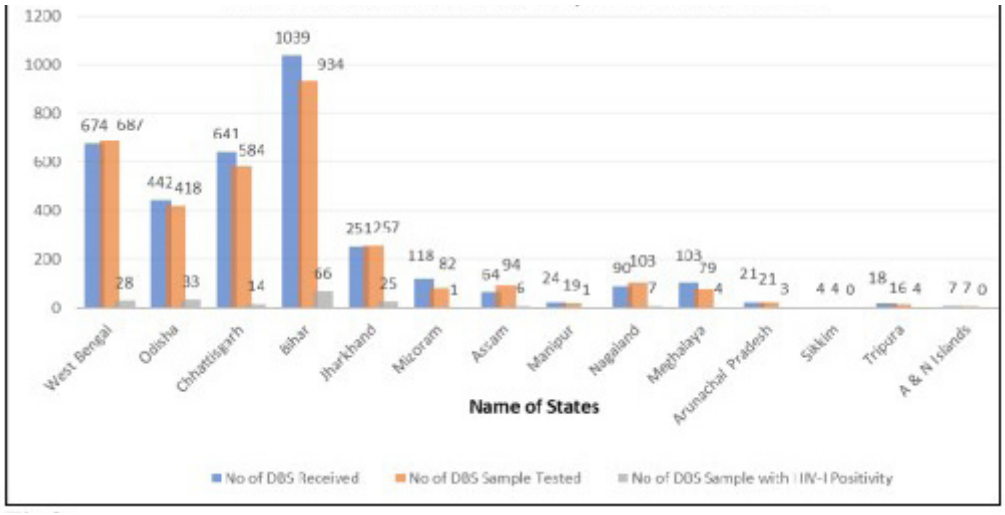


Fig2. EID Annual Report 2024 April - 2025 March

Brief outline of Outbreak Investigation

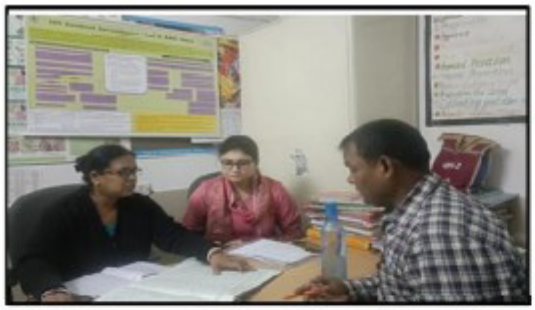
- Microbiological analysis was done for 21 water samples referred by the State Health Department during this period. Bacteriology division performed the bacteriological analysis and VRDL-NIRBI performed the detection of HAV and HEV in those samples.
- Dengue serotyping of 683 samples received from the state IDSP were performed at VRDL-NIRBI.
- Investigated and identified the case of a human case of avian influenza A (H9N2) virus from Malda district, West Bengal.

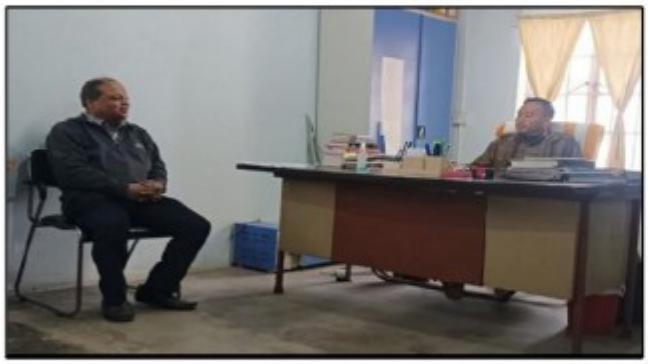
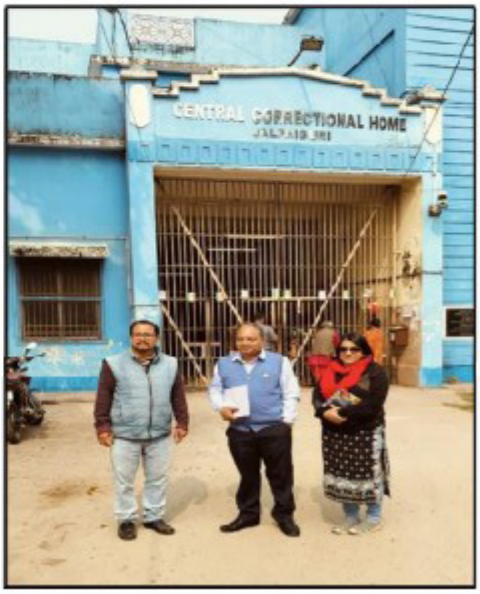
Brief outline of Training & Extension activities

Training Imparted	Period		Training Institute	No. of participants
	From	To		
Laboratory Diagnosis of Emerging Viral Diseases	14/05/2024	16/05/2024	ICMR-NIRBI	14
Biosafety and Biosecurity	16/05/2024	16/05/2024	ICMR-NIRBI	53
Foodborne Pathogen Training	27/05/2024	30/05/2024	ICMR-NIRBI	19
Profiency Testing Panel Distribution and NABL Accreditation for NRLs and ICTCs	20/08/2024	21/08/2024	ICMR-NIRBI	16
Surveillance of Foodborne Pathogens from North-East India	20/11/2024	22/11/2024	ICMR-NIRBI	22
Lab Testing of HSS plus 2025 (ANC and Prison)	20/01/2025	20/01/2025	ICMR-NIRBI	24
Capacity Building on Systematic Review and Meta-analysis	05/08/2024	09/08/2024	WHO, India & ICMR-NIRBI	33

The Regional Institute (East), ICMR-NIRBI, plays a pivotal role in implementing HIV surveillance and epidemiological activities across the eastern and north-eastern states of India, including Andaman & Nicobar Islands, Meghalaya, Nagaland, Sikkim, and West Bengal. Its primary objectives are to monitor the trends and prevalence of HIV infection, study its distribution among different population subgroups, identify emerging epidemic pockets, and generate reliable data for national HIV estimations and projections. The Institute undertakes HIV Sentinel Surveillance (HSS) among antenatal clinic attendees, high-risk groups (HRGs, bridge populations and Prison Inmates) while also contributing to surveillance of sexually transmitted infections, incidence, and mortality. Beyond implementation, it provides robust technical guidance and support to State AIDS Control Societies (SACS) for planning and execution of surveillance activities, including validation of new sites, training of site and laboratory personnel, and

constitution of State Surveillance Teams. The Institute actively conducts site visits for monitoring and supervision, ensures timely reporting and corrective action, and manages surveillance data through the Strategic Information Management System (SIMS). It also engages in operational research, in-depth analyses, and technical reviews to strengthen surveillance findings during inter-surveillance periods. Additionally, RI (East) extends technical support to NACO for capacity-building, national consultations, and the development of frameworks for Integrated Biological and Behavioural Surveillance (IBBS) among HRGs and Clients of Female Sex Workers. Through its multifaceted roles, the Institute significantly contributes to strengthening surveillance systems and evidence-based planning under the National AIDS Control Programme (NACP).



Conferences / Seminars /Workshops / Meetings / Trainings Attended

	प्रशिक्षण / सम्मेलन / सेशिनार/ वेशिनार आशि का शवषय Topic of Trainings/ Conferences/ Seminars/ Webinars etc.	आयोजक कर्ाा Conducted By	अवशि/Period से / From	कक / To
•	National Training of Trainers (ToT) for p-MPSE Round 2 was held at New Delhi. Project Coordinator and Research Officer from RI ICMR-NIRBI attended the meeting.	NACO	03.10.2024	04.10.2024
•	State level training for the state of Nagaland held at Kohima. RI officials attended the training as resource person.	ICMR-NIRBI in collaboration with Nagaland State AIDS Control Society (NSACS)	19.11.2024	21.11.2024
•	State level training for Andaman & Nicobar Islands held at Port Blair. RI Nodal Person and Project Coordinator attended the training as resource person.	ICMR-NIRBI in Collaboration with Andaman SACS	20.11.2024	22.11.2024

• State level training for Andaman & Nicobar Islands held at Port Blair. RI Nodal Person and Project Coordinator attended the training as resource person.	ICMR-NIRBI in Collaboration with Andaman SACS	20.11.2024	22.11.2024
• State level training for the state of West Bengal held during 28th – 29th November 2024 for North Bengal region and 9th & 10th December 2024 for South Bengal Region. RI officials and SST members attended the training as resource person.	ICMR-NIRBI in collaboration with West Bengal SACS in two batches, North Bengal and South Bengal.	28.11.2024 09.12.2024	29.11.2024 10.12.2024
• Site level training for Andaman & Nicobar Islands held during 10th – 12th December 2024 at Port Blair. RI officials and SST members attended the training as resource person.	ICMR-NIRBI in collaboration with Andaman SACS	10.12.2024	12.12.2024
• State level training for HSS for the state of Sikkim held at Gangtok. RI research officers and RI Nodal Person attended the training as resource person.	ICMR-NIRBI in collaboration with Sikkim SACS	17.12.2024	18.12.2024
• State level training for HSS for the state of Sikkim held at Gangtok. RI research officers and RI Nodal Person attended the training as resource person.	ICMR-NIRBI in collaboration with Sikkim SACS	17.12.2024	18.12.2024
• ANC & Prison site level training for the state of Meghalaya for Khasi & Jaintia region held during 7th – 10th January 2025 at Shillong and for Garo region during 13th -14th January 2025 at Tura. RI officials including RI Nodal Person and SST members attended the training as resource person.	ICMR-NIRBI in collaboration with Meghalaya SACS in two batches one in Shillong and another in Tura.	07.01.2025 13.01.2025	10.01.2025 14.01.2025
• State level training for HSS for the state of Nagaland held at Kohima. RI research officer and SST members attended the training as resource person.	ICMR-NIRBI in collaboration with Nagaland State AIDS Control Society (NSACS)	07.01.2025	10.01.2025
• National Training of Trainers (ToT) of Phase 2 for p-MPSE Round 2 was held at Bhubaneswar. Junior Consultant and Project Research Officer from RI ICMR-NIRBI attended the traning.	AIIMS Bhubaneswar	03.03.2025	04.03.2025

SERVICS PROVIDED BY INSTITUTE

NACO RI:

ICMR-NIRBI is the Regional Institute (RI) East for HIV Sentinel Surveillance. HIV Sentinel Surveillance (HSS) has been implemented among antenatal clinic attendees and prison inmates, and it is currently in progress at the national level for high-risk groups and bridge populations. ICMR-NIRBI serves as the lead institute for Integrated Biological and Behavioural Surveillance (IBBS) among High-risk group (HRG) populations, utilizing Respondent Driven Sampling (RDS). The institute is also spearheading two pilot activities: IBBS among Clients of Female Sex Workers (FSW) in West Bengal, Rajasthan, and Orissa, and Programmatic mapping and size estimation (p-MPSE) of Men who have sex with men (MSM) and Transgender (TG) individuals on virtual

networks in the states of Chhattisgarh and Nagaland. Other activities under the Integrated and Enhanced Surveillance and Epidemiology (IESE) include mortality surveillance among People Living with HIV (PLHIV) to determine the causes of death through verbal autopsy , IBBS among PLHIV registered to ART centers and p-MPSE among Clients of FSW in Nagaland.

Phage Typing of *Vibrio cholerae*

The Vibrio phage reference laboratory has been established as a reference center for comprehensive research on phage typing analysis of *V. cholerae* O1 biotype ElTor strains and *V. cholerae* O139 strains for numerous years. I am working in a service initiative titled "Nationwide screening of phage types of *V. cholerae* O1 and O139," which has significantly supported this endeavor. Our laboratory receives strains from medical colleges and research institutions for bio typing, sero-typing, and phage typing. The primary objective is to analyze the strains promptly and relay the results back efficiently, thereby aiding in the comprehension and monitoring of cholera outbreaks. The major emphasis of this project is to continue the phage typing analysis of the received strains, with a key aim being the swift and effective communication of the results back to the respective senders. Phage typing is essential in improving the understanding and surveillance of V. cholerae strains across the nation, ultimately contributing to the larger efforts in effectively monitoring and managing cholera outbreaks:

Samples obtained from various cholera-endemic regions and hospitals throughout the nation were initially verified as *V. cholerae* O1 biotype ElTor, followed by subsequent serological identification using polyvalent O1 and monospecific Inaba and Ogawa antisera. The phage typing investigation was conducted employing the traditional phage typing methodology established by Basu and Mukerjee, alongside the implementation of a novel phage typing scheme. Throughout this reporting period, a total of 293 samples were collected from a range of cholera-endemic locations and healthcare institutions in India. The majority of the identified strains were classified as *V. cholerae* O1 biotype ElTor, specifically the Ogawa serotype. Only two distinct phage types were recognized through the conventional phage typing scheme of Basu and Mukerjee. The new phage typing scheme effectively differentiated the strains into several types, with phage type 27 being the most prevalent, followed by type 25. We have conducted phage typing for all strains submitted to us and have communicated the results promptly.

National Repository of Antimicrobial Resistant Bacteria (NRAMRB): The National Repository of Antimicrobial Resistant Bacteria (NRAMRB) shared clinical strains of *P. aeruginosa, S. aureus, A. baumannii, E. coli,* and *K. pneumoniae* with scientists from CSIR-Indian Institute of Integrative Medicine, Jammu; University of Petroleum and Energy Studies (UPES), Dehradun; and the Division of Virology, ICMR-NIRBI.

Model Rural Health. Research Units, Darjeeling:
Novel Findings (First in the World/ India) e.g. Vectors, pathogens strains etc.
New Health Technologies

- Diagnostics
- Device
- Vaccines
- Therapeutics

Data for Decision making (Any registries or any other form of data collection for the decision making)
Improved Clinical or Public Health Care

Programme Support : Model Rural Health Research Unit- Darjeeling, West bengal
Initiated 6 projects
2 Collaborations- KolGOTRG (ICMR CCOE) & NBMC College of Nursing
1 implementation project through collaboration
1 clinical trial through collaboration
7 outreach activity (free health check up, diagnostic services)
Capacity building – 7 clinical research workshops trained 300 participants

Other Services:

- Dengue virus serotyping service to West Bengal State Health and NVBDCP as a service component of Arbovirus Referral Laboratory activities.
- Hepatitis C virus RNA detection, viral load estimation, genotyping and HCV drug resistance screening services are provided to the collaborative Medical Colleges and Hospitals as a service component

OUTBREAK INVESTIGATIONS

In view of an unusual diarrheal diseases outbreak in the city of Rourkela, a Central Multidisciplinary Team comprising of four expert members including a microbiologist from ICMR-NIRBI was deployed by Ministry of Health and Family Welfare, Govt. of India to Sundargarh, Odisha. The team was deployed in the diarrhoea affected area basically to assess the situation to suggest remedial actions for implementation of requisite public health measures.

Division of Parasitology provided diagnostic support for the isolation and identification of various parasitic organisms from clinical and environmental samples received from ICMR-National Institute of Virology (ICMR-NIV), screening more than 200 samples during Guillain-Barré Syndrome outbreak.

FLAGSHIP PROGRAMMES-SWACHH BHARAT CAMPAIGN:

The activities of ICMR-NIRBI under the Swachhta Action Programme during the period April 2024 to March 2025 included the following components –

- Swachhta Awareness Campaign among the school children
- Observation of Swacchta Pakhwada (2024)
- Special Campaign 4.0 in Government Offices (2nd October to 31st October, 2024)

A brief account of these activities are mentioned below.

Swachhta Programmes in the schools:

ICMR-NIRBI organized two school-based programmes to promote Swachhta-related awareness and practices among the school children and teachers. The ICMR-NIRBI team members discussed about water and food safety, sanitation and hygiene, especially to prevent various common illnesses among the children. They also distributed soap and handwash liquids in the participating schools. A total of 83 girl students along with their teachers attended these programmes.

Glimpses of school-based activities:

Special Swachhta Drives by ICMR-NIRBI:

Swachhta Special Campaign 4.0 including Swachhta Pakhwada (October 02 - 31, 2024)

Under this special campaign, the following activities were conducted by ICMR-NIRBI:

Date / Time	Activities	Venue	Participants
17/09/2024 (Tue) 10:30 am	Swachhta Pledge taking (by DG, ICMR)	Seminar Room (4th Floor), NIRBI-II	All staff of ICMR-NIRBI
18/09/2024 (Wed) 11:30 am	Plantation Drive under Ek Ped Maa Ke Naam	JICA – NIRBI-II campus	All staff of ICMR-NIRBI
19/09/2024 (Thu) 1:00 – 1:30 pm	Cleanliness Awareness Program for institute staff	Seminar Room (4th Floor), NIRBI-II	All staff of ICMR-NIRBI

20/09/2024 (Fri) 3:00 pm	Community-Based Workshop – • Waste segregation • Composting • Proper disposal methods	Ward No. 58, KMC	Dr. Alok Kr. Deb; Dr. Suman Kanungo
23/09/2024 (Mon) 11:30 am	Neighbourhood cleaning drive	Outside ID Hospital campus	Volunteer staff of ICMR-NIRBI
24/09/2024 (Tue) 11:30 am – 1:30 pm	Preventive Health Check-Up of Safai Mitras (BP, Weight, CBC, Random Sugar, HbA1c, Urea, Creatinine)	Seminar Room (4th Floor), NIRBI-II	Team of Doctors & Nurses of ICMR-NIRBI
25/09/2024 (Wed) 3:30 pm	Lecture at School for cleanliness awareness	Shanti Sangha Vidyayatan, Beliaghata	Dr. Debjit Chakraborty; Mr. Chandan Mandal
27/09/2024 (Fri) 3:00 pm	Cleanliness drive within campus	JICA-NIRBI-II campus	All staff of ICMR-NIRBI
30/09/2024 (Mon) 4:30 pm	Walkathon with banners	From NIRBI-II to NIRBI-I	All staff of ICMR-NIRBI
01/10/2024 (Tue) 10:30 am onwards	Inspection by Swachhta Committee members of the institute	Three buildings of ICMR-NIRBI	Members of Swachh Bharat Committee of ICMR-NIRBI
02/10/2024 (Wed) 11:00 am – 12:00 noon	Celebration of Swachhta Divas followed by felicitation of Safai Mitras (3 maintenance staff – one each from three buildings of ICMR-NIRBI)	Seminar Room (4th Floor), NIRBI-II	All staff of ICMR-NIRBI

Brief description of various activities are as follows:

Swachhata Hi Seva 2024 – Pledge Taking

The Director General-ICMR undertook a pledge on this event on 17th September, 2024 through video-conferencing followed by oath taking by Director, ICMR-NIRBI in Bengali version too. The event took place in Seminar Room (4th Floor) of NIRBI-II building. All scientists, staff and students participated.

Swachhata Hi Seva 2024 - Plantation Drive

As part of the Swachhata Hi Seva Campaign 2024, ICMR-NIRBI celebrated 'Ek Ped Maa Ke Naam' plantation drive under 'Swachhata Ki Bhaagidari' on 18 September 2024. A total of seven saplings were planted in the area surrounding the JICA building. All staff of the Institute wholeheartedly took part in the program to make it a grand success.

Swachhata Hi Seva 2024 - Safai Mitra Suraksha Shivir

As part of the Swachhata Hi Seva Campaign 2024, ICMR-NIRBI celebrated Safai Mitra Suraksha Shivir at the Institute on 24 September 2024. The medical scientists of ICMR-NIRBI along with technical officers, technical assistants and project technical support staff attended to a total of thirty-three Safai Mitras deputed in the three buildings of the Institute. Routine health check-ups like weight, BP, pulse, SpO2 and blood investigations like CBC, sugar, urea, creatinine, SGOT, SGPT, and HbA1c were performed along with special investigations if required.

Swachhata Hi Seva 2024 - Swachhata Divas

ICMR-NIRBI celebrated the Swachhata Divas on 02 October 2024 on the birth anniversary of Mahatma Gandhi to conclude the fortnight long Swachhata Hi Seva Campaign 2024 which began on 17 September. The Swachhata Anthem and the Campaign video were played followed by sharing views from the Director and the Administrative Officer. A video showcasing all the activities done this year under Swachhata Abhiyan was played followed by felicitation of three Safai Mitras from the three buildings of the Institute.







A. Important Meetings held at ICMR-NIRBI

52nd Scientific Advisory Committee (SAC) Meeting of ICMR-NIRBI held on 26.09.2024. Following welcome address by Director, ICMR- NIRBI, SAC Chairperson of ICMR-NIRBI addressed the Scientists about the institutional expectation. Secretary DHR & DG, ICMR addressed the SAC members and ICMR-NIRBI scientists online and emphasized on the expansion of mandate towards Bacterial Diseases and Antimicrobial Resistance. ICMR representative also mentioned about high quality of research on AMR being carried out at ICMR-NIRBI. Following Director`s overall presentation individual Scientists presented their intramural projects and SAC members provided useful comments for further improvement. The meeting ended with vote of thanks from Director, ICMR- NIRBI.

B. Visit of Scientists / Scientific Staff /Academicians

Dr. Saikat Majumdar, Assistant Professor, CSIR-Indian Institute of Chemical Biology delivered a talk on “IL-17 conditioning of stromal cells regulates inflammation and infection response” on 25.04.2024 at ICMR- NIRBI. His talk was followed by brainstorming interaction with the audience. Scientists, Research Fellows and students attended the seminar and made it successful.

Prof. (Dr.) Nihar Ranjan Biswas, MD, DM, DNB, DSc (Pharmacology), Vice Chancellor, Sri Balaji Vidyapeeth (Deemed to be University), Puducherry delivered a talk on "Access to Affordable Medicine and Promotion of Rational Therapeutics" on 21.05.2024 at ICMR- NICED. His talk was followed by brainstorming interaction with the audience. Scientists, Research Fellows and students attended the seminar and made it successful.

Dr. Atreyee Bhattacharyya, Ph.D, Assistant Professor, Amity Institute of Psychology and Allied Sciences, Amity University, Kolkata delivered a talk on "Dynamics of Wellbeing - An Exploration into the Third Wave of Positive Psychology" on 30.05.2024 at ICMR- NIRBI. Her talk was followed by brainstorming interaction with the audience. Scientists, Research Fellows and students attended the seminar and made it successful.

Dr. Abhik Saha, Assistant Professor, DBT/Welcome Trust IA Intermediate Fellow, Institute of Health Sciences, Presidency University delivered a talk on "Cellular Control of Epstein Barr virus Lytic Cycle Replication" on 20.06.2024 at ICMR- NIRBI. His talk was followed by brainstorming interaction with the audience. Scientists, Research Fellows and students attended the seminar and made it successful.

A visit from representatives of Japan Embassy and Consulate to ICMR – NIRBI took place on 19.12.2024. Mr. Jiro KODERA, Counsellor (Economy & Development) at the Embassy of Japan in India and Ms Shimada Megunmi, Researcher, Consulate General of Japan in Kolkata met the Director in Charge and other senior scientists. They discussed ongoing collaborations and future works. The cooperation and capacity-building for both India and Japan were emphasized

Dr. Trideb Mahata, Postdoc Fellow, Prof. Udi Qimron Lab Department of Clinical Microbiology and Immunology School of Medicine, Tel Aviv University, Tel-Aviv Israel, delivered a talk on "A Never-Ending War" on 16th January, 2025 at ICMR-NIRBI. His talk was followed by brainstorming interaction with the audience. Scientists, Research Fellows and students attended the seminar and made it successful.

Dr Wriddhiman Ghosh, Professor, Geomicrobiology Laboratory Department of Biological Sciences, Bose Institute delivered a talk on "Obligably aerobic life in a sulfidic (anoxic) habitat" on 23.01.2025. His talk was followed by brainstorming interaction with the audience. Scientists, Research Fellows and students attended the seminar and made it successful.

Dr. Alan Rein, Head, Retroviral Assembly Section, Emeritus, HIV Dynamics and Replication Program, National Cancer Institute, Frederick National Laboratory for Cancer Research, delivered a talk on "Molecular Mechanisms in Assembly of HIV-1 Particles" on 20th February, 2025 at ICMR-NIRBI. His talk was followed by brainstorming interaction with the audience. Scientists, Research Fellows and students attended the seminar and made it successful.

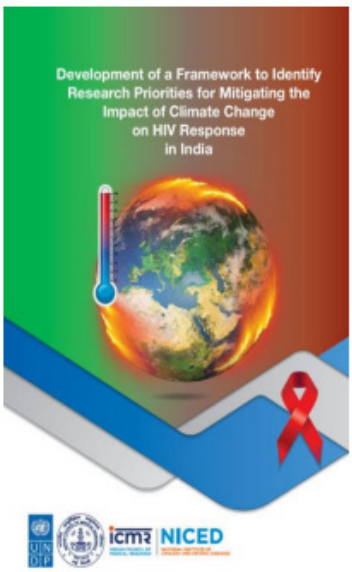
C. Technology Transfer

Director, ICMR-NIRBI has handed over the Technology transfer document related to EnViroQ, developed by ICMR-NIRBI, Kolkata to Dr. Pallab Saha, representative of M/S Mol Bio Diagnostics Ltd. on 6th February, 2025.

D. Training/ Workshop/ Conferences held at ICMR-NIRBI

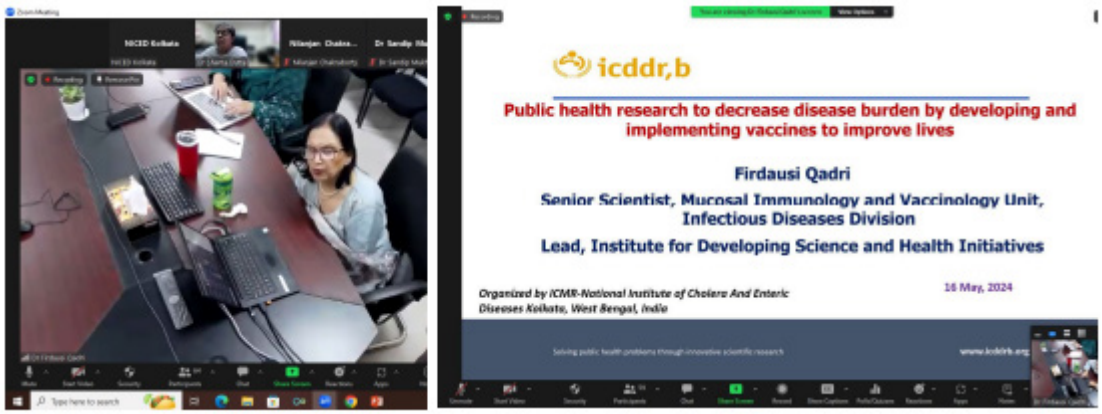
ICMR-NIRBI, DBT- IBSD and SFE hosted a two day conference "Exploring the Bioresources of India to fight against Antimicrobial Resistance (AMR)" on 4-5 April 2024, at Science City, Kolkata, bringing together experts from around the country to address one of the most pressing global health challenges of our time. Supported by ICMR and DBT, the conference focused on fostering a rich exchange of ideas and perspectives between two complementary fields of research – antimicrobial resistance and exploration of the vast array of natural compounds. The keynote speech was delivered by Dr. Padmanabhan Balaram, former Director of IISc, who highlighted the role of evolution in the development of antimicrobial resistance and emphasized the critical need for interdisciplinary collaboration and sustained research efforts to combat AMR effectively. In addition, Dr Arun Singh from AIIMS Jodhpur, also illustrated the need for enhanced sanitation and architectural planning of NICUs to reduce the possibility of AMR development. Other eminent invited speakers such as Dr Shanta Dutta (ICMR-NIRBI), Dr. Kh. Ranjana (RIMS, Imphal), Prof. Pulok Kumar Mukherjee (IBSD), Prof. Suparna Chatterjee (IPGMER), Dr. Dipankar Maji (Dept. of Health & Family Welfare, Govt. West Bengal, Kolkata), Dr. Asish K Mukhopadhyay and Dr. Sulagna Basu (ICMR-NIRBI) , Dr. Rajlakshmi Viswanathan (ICMR-NIV) and many more brought unique insights and expertise to the conference.

The dissemination program of the technical report and research brief of UNDP-funded project titled "Development of a Framework to identify Research Priorities for Mitigating the impact of Climate Change on HIV Response in India" was held at Hotel Pride Plaza, Kolkata 22nd April 2024. Dr. Shanta Dutta, Director, ICMR – NIRBI in her welcome address expressed the importance of this study and heartily welcomed all the dignitaries including Technical Resource Group members from diverse disciplines. Ms. Isabelle Tschan Deputy Resident Representative, UNDP graced the occasion and said about the conceptual framework and the final report developed from the meeting. Dr. Siddhartha Niyogi, Director of Health Services, Govt of West Bengal graced the occasion and encouraged ICMR – NIRBI to carry out such endeavours. Dr. Enna Dogra Gupta and Dr. Madhumathi J from ICMR HQ also expressed their views. Following the release of technical report and research brief, a brief presentation was made by Dr. Debjit Chakraborty, Scientist – E, ICMR- NIRBI. Representatives of NCDC, WBSAPCS,West Bengal State Public Health Department and TRG members appreciated the effort and expressed their views on utility of this report and possible way forward. The program ended with concluding remarks and vote of thanks from Dr. Alok Kumar Deb, Scientist G, ICMR- NIRBI.



A 3-days hands-on training along with operational training on HIV-1 Viral Load testing using the Roche COBAS 8800 was conducted by Roche and NACO-SHARE INDIA at ICMR-NIRBI, Kolkata from 23rd to 25th April 2024. Thirteen staff from ICMR-NIRBI completed the training. The COBAS 8800 will now be used for HIV-1 viral load testing for the national program in addition to the already existing Abbott platform.

ICMR-NIRBI organized a webinar on the theme "Controlling cholera in the sub-continent" on 16th May, 2024. Dr. Firdausi Qadri, Senior Director, Infectious Disease Division and Head, Mucosal Immunology and Vaccinology Unit, at ICDDR,B Dhaka, Bangladesh delivered a talk on "Public health research to decrease disease burden by developing and implementing vaccines to improve lives ". Following her talk, an online interactive discussion took place. Scientists/Medical professionals/students across various institutes participated in this webinar and made it a grand success.



'The 8th Hands on Training Workshop on 'Laboratory Diagnosis of Emerging Viral Diseases' was conducted by the Regional Virus Research Diagnostic Laboratory (VRDL), ICMR-NIRBI, Kolkata from 14-16th May 2024. The program included lectures on epidemiology of emerging viral infections, overview of viral diagnostic techniques, sample transport guidelines, Quality Control and Quality Assurance, and next-generation sequencing. Hands-on demonstration was given on triple layer packaging, serological and molecular techniques, and an overview of cell culture and bioinformatics pipeline for NGS data analysis. Fourteen participants attended the training workshop from different VRDLs of West Bengal and Bihar.

One hands-on laboratory training course was organized by ICMR-NIrbi during 27-31 May, 2024 under the ongoing ICMR-task force Phase II project on "Surveillance of foodborne disease pathogens from Northeast India". During the inauguration of the training course one revised version of SOP (Standard Operating Procedures) for detection of foodborne pathogens was released. 21 candidates from Meghalaya, Assam, Arunachal Pradesh, Manipur, Mizoram, and Nagaland participated in this training program. Training on detection and diagnostics using culture-based methods along with the molecular biology-based studies were imparted to the participants. This training program highlighted the crucial and contemporary aspects of detecting foodborne pathogens. This hands-on laboratory training course will help in useful skill development along with fruitful outcomes, which will be of benefit for the entire nation.

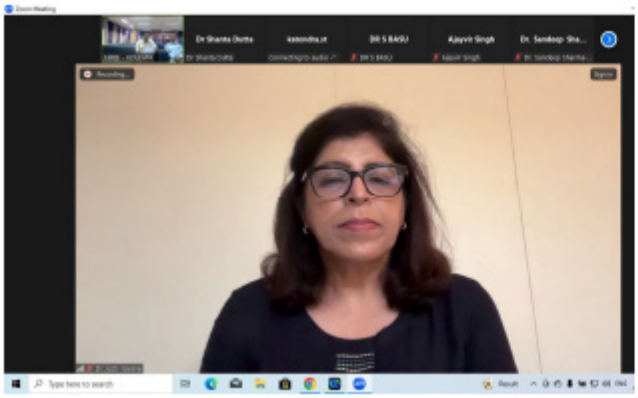
On the occasion of World Blood Donor Day, 14th June 2024, ICMR NIRBI organised a Pledge taking event. Under the leadership of Dr. Shanta Dutta, Director, ICMR - NIRBI a trilingual pledge (English, Hindi, Bengali) on blood donation was taken by Scientist, Technical and ministerial staff present. Following a health check-up camp has been organized where basic health assessment and eye check-ups were performed. Scientists, staff and students participated in the program and made it a grand success.

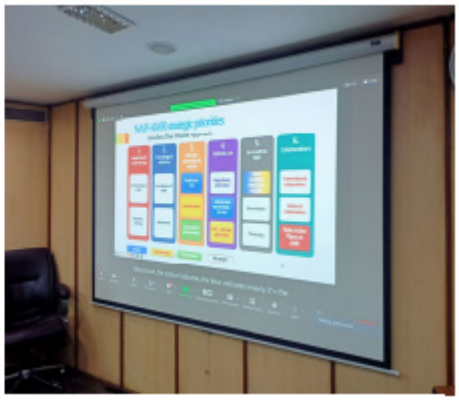
ICMR-NIRBI is celebrating the countdown of 10th International Day of Yoga 2024 on 19 th June 2024. The theme of International Yoga Day 2024 has been declared as “Yoga for Women Empowerment”. As part of this, Mr. Pallab Dasgupta, Yoga and Physiotherapist delivering a theme-based lecture on Yoga along with Demonstration & Practice of Common YOGA Protocol& YOGA Break Practice on 19th June 2024. All the scientific, administrative, technical & project staff, students participated by practicing yoga and made the program successful.

On the occasion of World Blood Donor Day, ICMR-NIRBI proudly continues its commitment to host a voluntary blood donation camp on 1st July 2024, coinciding with Doctor's Day, at NIRBI II Seminar Room from 11 a.m. onwards supported by RBTC, NRS Medical College, Kolkata graced the occasion along with his team. Dr. Shanta Dutta Director, ICMR- NIRBI stressed on the importance of voluntary blood donation and its impact on the society. Fifty participants voluntarily donated blood. Scientists, staff and students participated whole heartedly in this voluntary campaign under medical as well as dietary supervision and donated blood to save life and make a difference.

ICMR-NIRBI celebrated Doctor's Day on 1st July 2024 to commemorate the birth and death anniversary of the most famous physician of India, Dr. Bidhan Chandra Roy and to pay a tribute to his contributions to the public health in the country. On this occasion, Dr. Sourav Chowdhury, Consultant, Transfusion Medicine and Bone Marrow Transplant Coordinator, Apollo Multispecialty Hospital, Kolkata delivered a lecture on "Therapeutic Plasma Exchange: A New Horizon" at the Seminar Room of NIRBI II building. His lecture was followed by interactive sessions with the audience. All the scientific, administrative, technical & project staff, students participated in the programme and made it successful.

ICMR-NIRBI organized a webinar on the theme "Antimicrobial Resistance" on 3rd July, 2024. Dr. Jyoti Iravane, Professor Head, Microbiology, Government Medical College, Aurangabad delivered a talk on "AMR in India, challenges and way forward". Following her talk, an online interactive discussion took place. Scientists/Medical professionals/students across various institutes participated in this webinar and made it a grand success.





A one-day institutional visit was organized on 04.07.24, for the students of Bal Vidyamandir, Palace Compound, Imphal, Manipur, at ICMR-NIRBI in Kolkata. The visit was organised by Assam Rifles and IISER Kolkata to motivate the students by generating a positive impact on their psyche. Dr. Raina from Assam Rifles coordinated with ICMR-NIRBI for the program. The visit included 23 students from class VIII along with their respected teachers. The students were welcomed with an opening address by Dr. Shanta Dutta, Director, NIRBI. Next they were provided with a brief introduction to the lab before the tour. Following lunch, the students participated in a lab tour and hands-on session. They visited various laboratories at ICMR-NIRBI, including Bacteriology, Parasitology, Electron Microscopy and the Animal House. During these visits, they received practical demonstrations of research techniques. The program concluded with a closing remark by the Director.





A one-day training cum workshop was arranged in ICMR-NIRBI, Kolkata for the students of National Institute of Homeopathy, Kolkata on 19 Aug, 2024. About 90 final year students have participated in this training program. The students were welcomed with an opening address delivered by our honourable Director madam Dr. Shanta Dutta, followed by a brief introductory lecture to the attendees. Next, a series of educational lectures were delivered by the respected scientists of the institute, which are as follows-

- Bacterial etiological agents of Diarrhoea
- Parasitological etiological agents of Diarrhoea
- Viral etiological agents of Diarrhoea
- Biosafety in the laboratory and bioethics in clinical research
- Animal Model in Biological Research

After lunch the lab tour and hands on session took place. Students in few groups have visited various laboratories of ICMR-NIRBI viz. Bacteriology, Parasitology, Virology, and Animal House for practical demonstration of research techniques. The program was ended with a concluding remark by the Director.





"A Workshop on "Proficiency Testing Panel Distribution and NABL Accreditation for SRLs & ICTCs" was conducted on 20th and 21st August, 2024 by NACO-NRL at ICMR-NIRBI, Kolkata. 16 Participants from Six states namely Mizoram, Meghalaya, Assam, Jharkhand, Odisha and Andaman & Nicobar Islands joined the workshop which covered diverse topics like activities of NRL, QMS Implementation, Biosafety and Biosecurity practices, Web based program NACO-Prayogshala etc. The workshop turned up to be a grand success with the contributions of the organizing team and active participation of the delegates.

ICMR - NIRBI in collaboration with WHO organized a Five Day Residential Capacity Building Workshop on Systematic Review and Meta Analysis from 5th to 9th August, 2024 at Hotel Howard Johnson, Kolkata.The workshop included in depth concepts of different types of Reviews, Scoping & Systematic Reviews and Meta Analysis along with hands on training on different aspects of search strategy, protocol registration, PRISMA, Risk of Bias, Forest plot etc. Eminent faculties were Dr. Anju Sinha Pradhan, ICMR-Cochrane Collaboration, India Dr. Bhoomika TV, Campbell South Asia, Dr Richard Kirubakaran, Centre for Biostatics and Evidence Based Medicine, Vellore and Dr. Komal Shah, IIPH Gandhinagar. Participants comprises of a heterogeneous group from different institutes all over India and expressed their keen interest towards the workshop and future.



ICMR - NIRBI in collaboration with National AIDS Control Organization (NACO), Govt. of India has organized a three days Review meeting and Workshop on AIDS Epidemic Model (AEM), from 12th to 14th August, 2024, as a part of implementation process of AEM in Phase I States of North Eastern India, viz. Manipur, Mizoram and Nagaland under NACP-V. Eminent experts Dr. Damodar Sahu, Dr. Nalini Chandra, UNAIDS and Dr. Subrata Biswas NACO were present along with the participants from four different Regional Institutes viz. AIIMS Jodhpur, AIIMS Bhubaneswar, RIMS-Imphal and ICMR-NIRBI. The program led to fruitful discussion towards development of appropriate model for Indian HIV epidemic context.

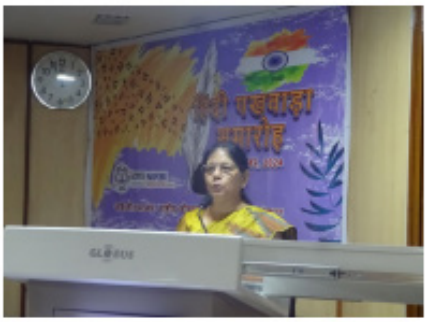

Celebration of the 78th Independence Day of India at ICMR-NIRBI. Director, Staff and their family members participated in the flag hoisting ceremony at 11.00 a.m. on 15th August, 2024 at the premises of NIRBI-1 building. Following hoisting of National Flag and inaugural address by Dr. Shanta Dutta, Director, ICMR-NIRBI, a few other staff expressed their views on the importance of the Independence Day in our everyday life. Staff and Students performed a small cultural program on patriotism. The National Anthem was sung at the end of the program.

ICMR- NIRBI observed the National Sports Day on 29th -30th August 2024. Different outdoor (Football, Badminton, Tug of War, spoon race) and indoor games (carrom) were organized at NIRBI-I premises on 29.08.2024. The Prize Distribution Ceremony programme was organized on 30.08.2024. On this occasion, Dr. Shanta Dutta, Director emphasized the importance of Sports in our everyday life as well as shaping our personality. She also felicitated. Mr. Goutam Sarkar, former player of the Indian National Football Team. Mr. Sarkar delivered an inspiring talk about engaging in Sport for a healthier and prosperous livelihood and presented trophy to the winning team of Football Match. Fit India pledge was taken in English, Hindi and Bengali. All the scientific, administrative, technical & project staff, students actively participated in the event and made it successful.

On behalf of ICMR, ICMR-NIRBI successfully completed their participation in 27th National Health Exhibition organised by Central Calcutta Science and Culture Organization for Youth, Ananda Bhawan, 10D, Ananda Bhawan, Entally, Kolkata 700014 from September 11-14, 2024. Scientists & Staff members of ICMR-NICED actively participated in this Public Health Programme. The overall purpose of making people aware about the happenings in medical research as well as in public health arenas. Messages about important yet simple preventive and curative practices that could be undertaken at the household level were disseminated in local language and with pictures whenever possible. The ICMR pavilion was decorated with high

quality Scientific Posters depicting Activities, Achievements and Contributions of the ICMR Institutes including those from ICMR – NIRBI towards Health Research and National Health Programmes. Posters showcasing the research journey and major milestones of ICMR including ICMR-NIRBI were displayed such as step towards elimination of Kala azar, LF, Covaxin trial, battle against COVID -19 Pandemic. Establishment of National Antimicrobial Resistance Hub, New Innovations on Enteric disease research, mobile stroke unit etc. Information-education-communication (IEC) materials prepared by the staff of ICMR-NIRBI on hand washing, diarrhea management at home, rational use of antibiotics were distributed and explained to people attending the exhibition. The presentation by ICMR received overwhelming response and appreciation by a large number of visitors as seen from the attendance in the stall.

आज संस्थान में हिंदी पखवाड़ा का समारोह संपन्न हुआ। कार्यक्रम में मुख्य अतिथि वक्ता के रूप में श्रीमती सुनीता केशवानी, सहायक निदेशक (राजभाषा), प्रधान मुख्य आयकर आयुक्त, प. बंएवं सक्किमि और संस्थान की निदेशक डॉ शांता दत्ता उपस्थिति थी। पिछले दिनों में हुए निबंध लेखन प्रतियोगिता और आशुभाषण प्रतियोगिता के प्रतिभागियों को प्रमाण-पत्र और पुरस्कार वितरित किया गया। इसके बाद संस्थान के कर्मचारियों और छात्रों द्वारा सांस्कृतिक कार्यक्रम भी आयोजित किया गया।



Under 'Swachhta Hi Seva' initiative, cleaning and sweeping activities were performed on 27.09.2024 inside the premises of ICMR-NIRBI. Scientists and staff participated in the activity with good enthusiasm.

Under 'Swachhta Hi Seva' initiative, a walkathon program was held at ICMR-NIRBI on 30.09.2024. The NIRBI team led by Dr. Shanta Dutta, Director, ICMR- NIRBI walked from NIRBI-II building to NIRBI – I building through CIT Road displaying banner, leaflets on cleanliness. Scientists, staff and students participated in the activity with good enthusiasm.

ICMR-NIRBI celebrated the Swachhata Divas on 02 October 2024 on the birth anniversary of Mahatma Gandhi to conclude the fortnight long Swachhata Hi Seva Campaign 2024 which began on 17 September. The Swachhata Anthem and the Campaign video were played followed by views from the Director and the Administrative Officer. A video showcasing all the activities done this year under Swachhata Abhijan was played followed by felicitation of three Safai Mitras from the three buildings of the Institute.



राजभाषा की त्रैमासकि गतविधियिों (अक्टूबर-दसिंबर) के अंतर्गत आज संस्थान में हदिी सेमनिार का आयोजन कयिा गया था। इस सेमनिार में मुख्य अतथि वक्ता के तौर पर डॉ. दीपकिा केडयिा, एमबीबीएस, एमआरसीपी, एफआरसीपी, कंसल्टेंट लविर स्पेशलस्टि और गैस्ट्रोएंटेरोलॉजस्टि उपस्थति थी। उन्होंने "फैटी लविर - क्या यह चति का वषिय है?" पर व्याख्यान दयिा। इस सेमीनार में संस्थान के वैज्ञानकिगण और कर्मचारी उपस्थति थे।


ICMR – NIRBI observed Integrity Pledge Ceremony on 25.10.2024. Integrity pledge was taken in Hindi, English under the leadership of Dr. Rajiv Bahl, Secretary DHR and Director General, ICMR. Dr. Shanta Dutta, Director, ICMR- NIRBI led the pledge taking in Bengali. All scientific, technical and ministerial staff participated in the program and made it successful.


As a part of creating awareness towards corruption ICMR- NIRBI observed Vigilance Awareness Week (28.10.24 – 02.11.24) through arrangement of essay writing, slogan writing and quiz competition with participation of staff of ICMR – NIRBI on 30.10.2024. The participants

enthusiastically took part in the competition. Winners of the competition were awarded on 1st November, 2024.





Regional Training of Trainers for HIV Sentinel Surveillance (HSS) Plus-2025 was held during 4th to 6th November 2024 at ICMR-NIRBI. This training was organized by Regional Institute (East) for HSS, ICMR-NIRBI in collaboration with National AIDS Control Organization (NACO), for the states of A&N Islands, Meghalaya, Nagaland, Sikkim and West Bengal. Director & other Scientists of ICMR-NIRBI, HSS Focal persons & other officials from State AIDS Control Societies, State surveillance Team members from the above-mentioned states, official from NACO and RI team members participated in the training. On the occasion of Sexual Harassment at Workplace Prevention Week 2024, ICMR-NIRBI organized an Online Training session on 10th December 2024.


ICMR-NIRBI successfully organized a curtain raiser program of India International Science Festival (IISF) 2024 on 8th November 2024. The theme of the program was Transforming India into a Science and Technology Driven Global Manufacturing Hub. Following the inaugural speech by Dr. Shanta Dutta, Director, ICMR-NIRBI, Kolkata, Guest of Honor Dr. Samit Guha, Asst. Professor, Jadavpur University and Secretary, Vijnana Bharati, West Bengal shared his thoughts on the event and the glorious legacy of science in India. Next Dr. Koustub Panda, Professor and Head, Department of Biotechnology; Dr. B.C. Guha Centre for Genetic Engineering & Biotechnology, University of Calcutta, delivered his interactive scientific lecture on "Innovation and Job Creation; the way forward". The students of Buniyadi Vidyapith School, Beliaghata along with Scientists, Staff and Students of ICMR-NIRBI actively participated in this Programme and made the event




Observation of Antimicrobial Awareness Week: ICMR-NIRBI organized the following programmes

- ICMR – NIRBI conducted a community talk at Sonarpur Block Primary Health Centre where different community members (doctors, schoolteacher, data manager, elected member of gram panchayet, ASHA etc) expressed their views on responsible Antimicrobial use to prevent AMR. Community ownership in AMR movement also came out in the discussion.



- ICMR – NIRBI organized a slogan writing competition on Responsible Antibiotic Use to Prevent AMR on 19.11.2024. Staff, students, research fellows of the institute actively participated the program and made the event successful.

- ICMR – NIRBI conducted a group discussion among doctors and nurses of Salt Lake Subdivisional Hospitals on 20.11.2024 on rational prescribing of antibiotics in day to day practice with emphasis on WHO AWaRe classification of Antibiotics. All doctors and nurses actively participated in the discussion and made the program a grand success.

- ICMR – NIRBI conducted an awareness program on Antimicrobial Resistance and antibiotic literacy among students and teachers of a Shakti Sangha Vidyatan girl school in Beliaghata on 21.11.2024. Students and teachers actively participated in the discussion and made the program a grand success.

- ICMR – NIRBI celebrated the closing ceremony of World Antimicrobial Resistance Awareness Week 2024 on 22.11.2024. Following welcome address by Dr. Shanta Dutta, Director, ICMR - NIRBI, Dr. Sulagna Basu, Scientist G briefed the audience about the AMR week celebration program activities of ICMR – NIRBI by showing a video clip.
  Next Dr. Sandip Mukhopadhyay, Scientist E delivered a talk on Responsible Antibiotic Use. Prizes were distributed to the winners of slogan competition held on 19.11.2024. Scientists, staff, research fellows and students attended the program and made it successful.

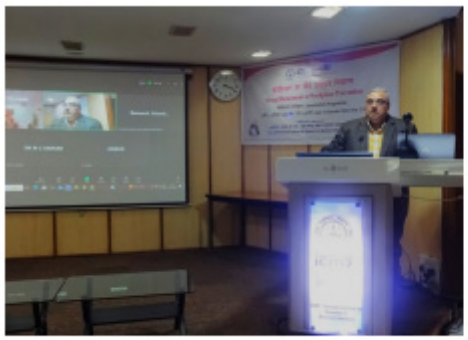
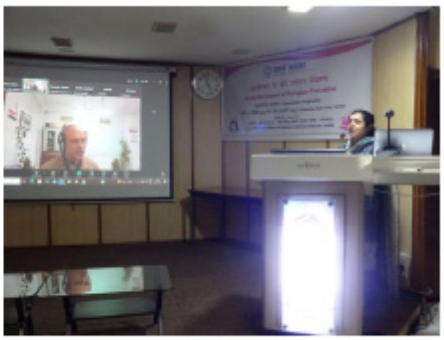
ICMR- NIRBI observed Constitution Day of India on 26th November 2024 through reading of the Preamble of the Constitution of India. Preamble was read in Hindi and English by all scientific, technical and ministerial staff of ICMR- NIRBI simultaneously with ICMR Headquarter led by Dr. Rajiv Bahl, Director General, ICMR. Dr.Shanta Dutta, Director, ICMR- NIRBI led the reading of Preamble in Bengali.

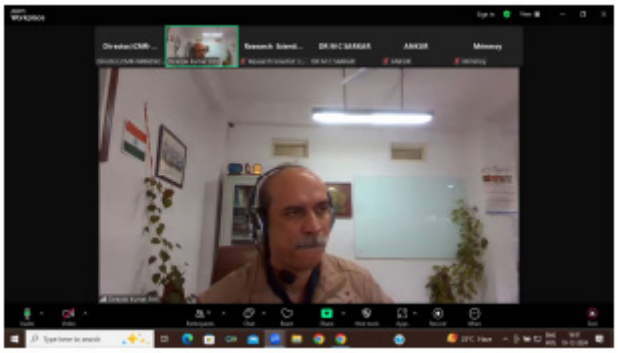
ICMR-NIRBI observed World AIDS Day (1st December) on 2nd December 2024.The theme for this year is "Take the Rights Path: My Health, My Right". Dr. Amit Pal, Director-in-charge emphasized on the significance of this day. Dr Shanta Dutta, Former Director ICMR-NIRBI attended the event as special guest. Srimati Bishakha Laskar, Secretary and Dr Protim Ray from Durbar Mahila Samannaya Committee also attended this event. A talk on the issues of the LGBTQA+ Community was presented by Mr. Souvik Ghosh Giri followed by cultural performance staged by the team of Nataraj Dance Group and Kolkata Rista. The program ended with a drama by staff of ICMR-NIRBI.





Mr. Deepak Bist, Joint Director (Coordination), Institute of Secretariat Training and Management Department of Personnel & Training (DOPT), New Delhi delivered a talk on POSH Act with special focus on conduct of inquiry by members of the Internal Complaints Committee. His talk was followed by brainstorming interaction with the audience. Scientists, technical, ministerial & project staff, research fellows and students attended the program and made it successful.



On the occasion of celebration of 76th Republic Day of India at ICMR-NIRBI, Kolkata. Director, Staff and their family members participated in the flag hoisting ceremony on 26th January 2025 at the premises of NIRBI-I building. Following Welcome Address by Dr. Santasabuj Das, Director, ICMR- NIRBI, flag hoisting ceremony and Republic Day Parade was performed. A walk for 'Bikshit Bharat'- Sankalp Yatra was taken from NIRBI I to NIRBI II building following which the institute enthusiastically participated in a cultural program comprising of patriotic songs, recitation, dance, skit performance and a quiz on India's Republic and Science. National Anthem was performed by the staff to conclude the program.



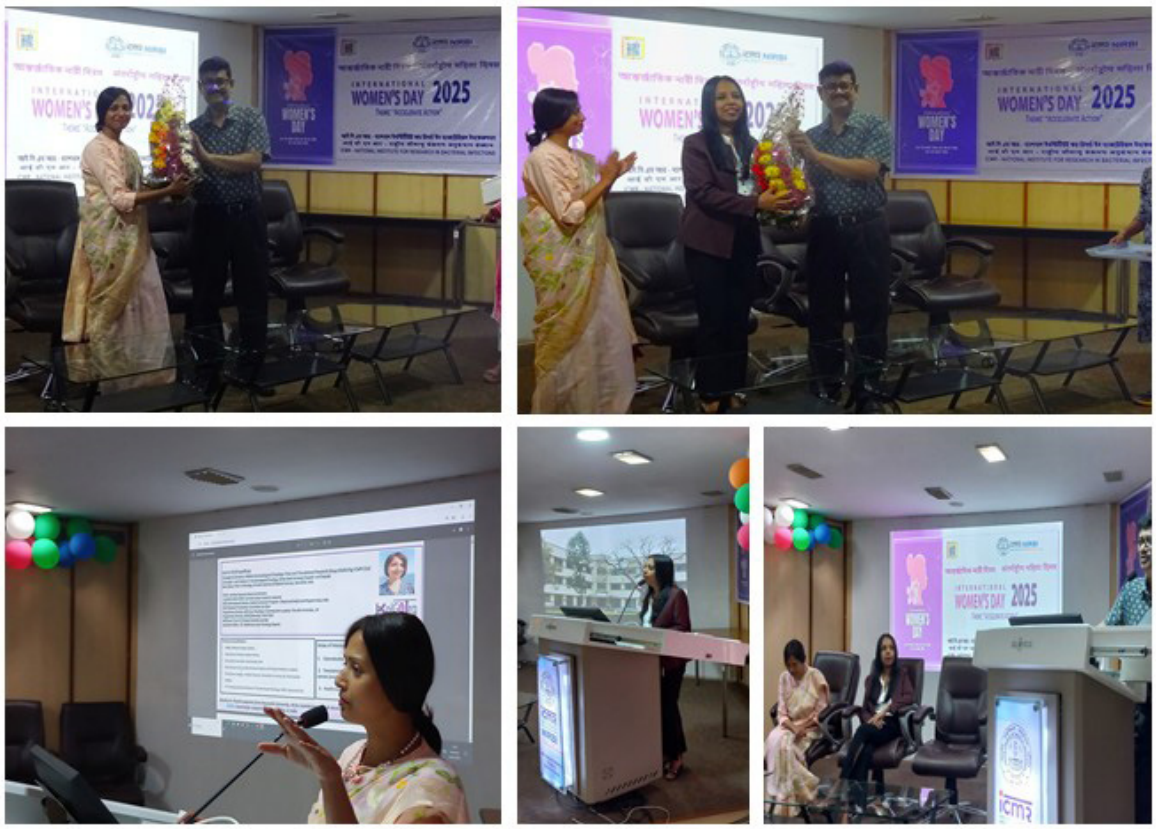

National Science Day 2025 was observed at ICMR- NIRBI on 28th February 2025. The theme of this year was "Empowering Indian Youth for Global Leadership in Science and Innovation for VIKSIT Bharat". Prof (Dr.) Pranabashish Banerjee, Professor, Department of Otorhinolaryngology, NRS Medical College, Kolkata graced the occasion as Chief Guest and delivered a popular lecture on "Various Types of Foreign Bodies Presenting as ENT Emergencies" Following the lecture there was interactive discussion on the topic with the audience. All Scientists, technical, administrative, project staff and students participated and made the event successful.



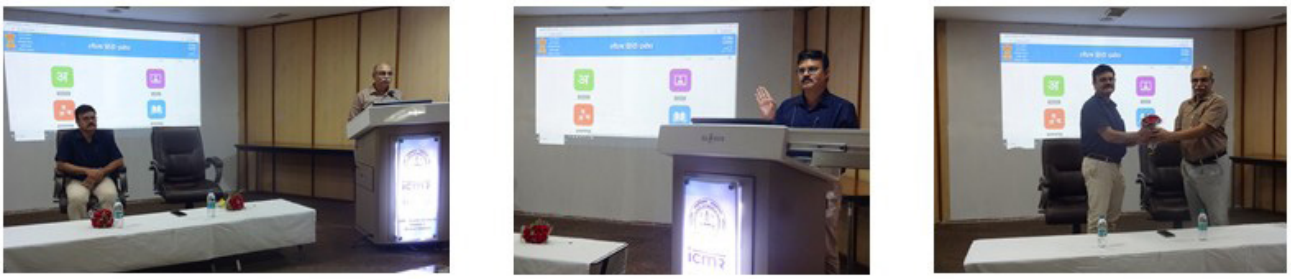
The 63rd Foundation Day (18.02.2025) of ICMR-NIRBI was celebrated on 07.03.2025. Following inaugural song by staff & students, Dr. Santasabuj Das, Director, ICMR-NIRBI, in his welcome address mentioned the glorious journey and evolution of this institute over the years as well as its new responsibilities as ICMR – NIRBI addressing Antimicrobial Resistance and Bacterial Infections. Following lighting of ceremonial lamp, deliberations were given by Chief Guest Prof (Dr) Ramji Singh, Executive Director AIIMS Kalyani, Guest of Honours Dr. Dipankar Maji, Dr. Partha Sarathi Mitra and Prof Arun Kumarendra Singh. Dr. Rajiv Bahl, Secretary DHR and Director General, Indian Council of Medical Research, virtually congratulated the institute for

its very high-quality achievement over last 63 years and inspired the staff to work with further enhanced efficiency in the line of expanded mandate. Dr. Samiran Panda, Former Additional Director General, Indian Council of Medical Research delivered the ICMR-NIRBI Foundation Day Oration 2025 on "Treading the Path of Uncertainty: A Journey That Started with Vayudoot & HIV" in which he intricately fabricated the importance of faces and cultures in public health beyond the numbers. Dr. Amit Pal and Mr. Pradip Samanta completing 25 years' service were felicitated. The program ended with Cultural Program by Staff and Students and Mime show. All scientists, regular and project staff, pensioners and students participated in the ceremony to make the event successful.

ICMR-NIRBI, observed the International Women's Day on March 10, 2025. The theme of women's day of this year is "Accelerate Action". Dr. Santasabuj Das, Director, ICMR- NIRBI inaugurated the program with his inspiring welcome address where he encouraged on gender sensitive inclusion. Dr. Asima Mukhopadhyay, Founder & Director, Kolkata Gynecological Oncology Trials and Translational Research Group (KolGo Trg)-ICMR CCOE, Kolkata and Dr. Sudeshna Ganguly, Medical Director, India and Indian Subcontinent, Teladoc Health International enlightened on the different perspectives they bring to the profession including their journeys and experiences. Participation of Scientists, administrative, technical, project staff and students made the event successful.



राजभाषा के तमिाही (जनवरी-मार्च) गतविधि के अंतर्गत आज हमारे कार्यालय, आईसीएमआर-राष्ट्रीय जीवाणु संक्रमण अनुसंधान संस्थान में एक हदिी व्याख्यान आयोजति की गई। इस अवसर पर श्री भरत सहि राजपूत, वरषि्ठ अनुवाद अधकिारी, वाणज्यिकि जानकारी एवं सांख्यकिी महानदिेशालय ने "भारत सरकार की राजभाषा नीत ऐतहिासकि पृष्ठभूम, कार्यान्वयन, तकनीकी टूल्स लीला" वषिय पर व्याख्यान प्रस्तुत कयिा, जसिमें कार्यालय के लगभग सभी वैज्ञानकि, प्रशासनकि और तकनीकी कर्मचारयिों की उपस्थति थी।



EXTRAMURAL PROJECTS

Project Title	A multicentric longitudinal cohort with nested case-control study for the assessment of immunological correlates of long-term protection against SARS-CoV-2 infection among fully vaccinated health-care workers
Name of PI	Dr Santasabuj Das
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr Mitali Chatterjee, IPGMER, Kolkata. Dr Arunanshu Talukdar, Medical College & Hospital, Kolkata
Funding Agency	ICMR
Period	June'2022-May'2025
Project Title	"Characterization in vivo diagnosis and role of pathogenesis of L Form *Salmonella* Typhi"
Name of PI	Dr. Santasabuj Das
Funding Agency	ICMR
Period	Nov'2022-Oct'2025
Project Title	Development of broad specificity conjugate vaccine against *Salmonella* Typhi, Paratyphi and non- typhoidal Salmonella infections
Name of PI	Dr Santasabuj Das
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	
Funding Agency	ICMR
Period	1st April'2021-30th Sept'2024
Project Title	Changing pattern of the *Vibrio cholerae* strains in India along with the antimicrobial resistance and its relationship with pathogenesis for better management of cholera
Name of PI	Dr. A.K. Mukhopadhyay
Funding Agency	AMED Japan through Okayama University
Period	2021-2027
Project Title	Genomic (WGS) surveillance of bacterial enteric pathogens in India
Name of PI	Dr. A. K. Mukhopadhyay
Funding Agency	NIID, Japan
Period	2021-2026
Project Title	Surveillance of foodborne disease pathogens from North-east India
Name of PI	Dr. A. K. Mukhopadhyay
Funding Agency	ICMR
Period	2022-2026

Project Title	Identification of novel Anti-Parasitic Compound from Natural Medicinal source and their effect on *Giardia lamblia*
Name of PI	Dr. Sandipan Ganguly
Funding Agency	CSIR
Period	2019-2024

Project Title	State wise prevalence mapping of soil transmitted helminthes in Indian children to support health impact evaluation. A ministry of health and family welfare, Govt. of India initiative
Name of PI	Dr. Sandipan Ganguly
Funding Agency	WHO
Period	2014-till date

Project Title	Coinfection Dynamics and Pathogenic Interplay between Parasitic Microorganisms and *Helicobacter pylori* for Unravelling the Complex Microbial Interrelationship
Name of PI	Dr. Sandipan Ganguly
Funding Agency	ICMR
Period	2025-2030

Project Title	Studies on Comparative Pathogenicity of *Entamoeba moshkovskii* with *Entamoeba histolytica*.
Name of PI	Dr. Sandipan Ganguly
Funding Agency	UGC
Period	2024-2029

Project Title	Studies on the role of *Leishmania donovani* Mevalonate Kinase (LdMVK) in modulation of host innate immune response and Autophagy in visceral leishmaniasis.
Name of PI	Dr. Sandipan Gnaguly
Funding Agency	UGC
Period	2022-2027

Project Title	Exploring the Antiprotozoal Activity of Ursolic Acid on *Entamoeba* spp
Name of PI	Dr. Sandipan Gnaguly
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	NA
Funding Agency	UGC
Period	2023-2028

Project Title	Identification of rotavirus induced dysregulated lncRNAs: An insight into the role of lncRNAs in regulating Rv infection
Name of PI	Dr. M. Chawla Sarkar
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Moumita Bhaumik. Sc C, ICMR-NICED

Funding Agency	DST SERB-Power
Period	Ongoing
Project Title	National Repository of Antimicrobial Resistant Bacteria (NRAMRB): a facility under the "AMR Hub" for addressing AMR research across India
Name of PI	Dr. Sulagna Basu, ICMR-NIRBI
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	*Co-Principal Investigator* Dr. Ranjan Kumar Nandy, Scientist G, ICMR-NIRBI *Co-Investigators* Dr. Asish Mukhopadhyay, Scientist G, ICMR-NIRBI Dr. Debjit Chakraborty, Scientist E, ICMR-NIRBI Dr. Surajit Basak, Scientist D, ICMR-NIRBI Dr. Agniva Majumdar, Scientist D, ICMR-NIRBI *Collaborators* ICMR, New Delhi; AIIMS, New Delhi; PGIMER, Chandigarh; JIPMER, Pondicherry; CMC, Vellore.
Funding Agency	ICMR
Period	2021-2025
Project Title	Diagnostics for Hypervirulent *Klebsiella pneumoniae* causing sepsis targeting Resistance and Virulence determinants ($DH_{Kp}RUV$)
Name of PI	Dr. Sulagna Basu, ICMR-NIRBI
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Saugata Hazra, IIT-Roorkee IIT-Roorkee, ICMR-NIRBI, IPGMER & SSKM Hospital, Bankura Sammilani Medical College and Hospital (BSMCH), Medical College and Hospital, Kolkata (MCH), Calcutta Medical College and Hospital.
Funding Agency	ICMR
Period	2024-2027
Project Title	Characterisation of CRISPR-Cas system in drug-resistant gram-negative bacteria and its application in preventing horizontal gene transfer in bacteria.
Name of PI	Dr. Sulagna Basu, ICMR-NIRBI
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Dipanjan Ghosh, NIPER, Kolkata
Funding Agency	ICMR
Period	2023-2026
Project Title	Mapping the impact of birth mode on maternal and infant intestinal microbiome including virome and resistome development of allergic disorders and antimicrobial resistance.
Name of PI	Dr. Mallika Lavania, ICMR-NIV,
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Sulagna Basu, ICMR-NIRBI Dr. Rajlakshmi Viswanathan, ICMR-NIV, ICMR-NIV

Funding Agency	ICMR
Period	2023-2026
Project Title	Surveillance of foodborne disease pathogens from North- East India
Name of PI	Dr. T. Ramamurthy
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Nilanjan Chakraborty (Scientist- F), ICMR-NICED Virus Research Laboratory
Funding Agency	ICMR Task Force Project
Period	2021 to 2025
Project Title	Immunogenicity and safety of JENVAC and JEEV vaccines administered in an interchangeable dosing schedule among Healthy Indian children: A Multicentric, Phase IV, Open-Labeled, Randomized, Controlled Trial
Name of PI	Dr. Suman Kanungo, Scientist F
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Sandip samanta, Associate Professor & MSVP, Dr. B. C. Roy P.G.I.P.S Dr. Shanta Dutta, Scientist G, ICMR- NIRBI Dr. Agniva Majumder, Scientist- C, ICMR-NIRBI Dr. Shubarna Chakraborty, Scientist-B, ICMR-NIRBI
Funding Agency	ICMR
Period	2023- ongoing
Project Title	A Phase III, Multicentre, Randomized, Double-Blind, Placebo-Controlled Studt to Evaluate the Efficacy, Immunogenicity and Safety of Single Dose of Dengue
Name of PI	Tetravalent Vaccine Live Attenuated (Recombinant,
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Lyphilized) – 'DengiAll' of Panacea Biotec Limited in Healthy Indian Adults Dr. Suman Kanungo, Scientist F Dr. Provash Chandra Sadhukhan (Scientist E, ICMR-NIRBI) Dr. Pramit Ghosh (Scientist E, ICMR-NIRBI) Dr. Agniva Majumdar (Scientist- D, ICMR-NIRBI)
Funding Agency	Panacea Biotec through ICMR
Period	2024- ongoing
Project Title	Determining cause of death profiles among vulnerable communities to improve health interventions: pilot test of a practical verbal autopsy tool
Name of PI	Dr. Suman Kanungo, Scientist F
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Shanta Dutta, Scientist G Dr. Melissa Lewis, Scientist C Dr. Suparna Chatterjee, Professor, Dept of

	Pharmacology, IPGME&R, Kolkata Dr. Indrani Das, Associate Prof and HOD, Dept. Of FMT, IPGME&R, Kolkata Dr. Kalpana Dutta Professor & Head, Dept. of Pediatrics, Medical College, Kolkata Dr. Soumitra Ghosh, Professor & Head, Geriatric Medicine Dept, Medical College Kolkata Dr. Sandip Samanta, Professor and Medical Superintendent cum Vice Principal, Dr. BC Roy Post Graduate Institute of Paediatric Sciences, Kolkata Professor Debarati Guha-Sapir, University of Louvain School of Public Health and Medicine, (CRED-ASED) Brussel and Senior Fellow Johns Hopkins Bloomberg School of Public Health Dr. Henry Kalter, Associate at Johns Hopkins Bloomberg School of Public Health
Funding Agency	CRED-ASED and University of Louvain, Brussels
Period	2024 - ongoing
Project Title	Impact assessment of administering OCV in selected cholera vulnerable district of West Bengal using state health machinery
Name of PI	Dr. Suman Kanungo, Scientist F
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Pramit Ghosh Scientist E Dr. Alok Deb, Scientist F Dr. Asish K Mukhopadhyay, Scientist G Dr. Ranjan Kumar Nandy, Scientist G Dr. Debjit Chakraborty, Scientist E Dr. Falguni Debnath, Scientist D
Funding Agency	ICMR
Period	2024- ongoing
Project Title	Antibody Response Following One Dose of Cervavac® as compared to One Dose of Gardasil® Vaccine in Healthy Indian Girls Aged 9-14 Years: A Non-inferiority, Multicenter, Double-blind, Randomized Controlled trial Intramural, Project
Name of PI	Dr. Suman Kanungo, Scientist F
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Pramit Ghosh (Scientist E, ICMR-NIRBI) Dr. Agniva Majumdar (Scientist- D, ICMR-NIRBI) Dr. Sandip Samanta, Associate Professor and Medical Superintendent cum Vice Principal (Dr. B.C Roy Post Graduate Institute of Paediatric Sciences, Kolkata)
Funding Agency	ICMR
Period	2024- ongoing

Project Title	A Phase II/III, Multicenter, Double-Blind, Randomized, Active Controlled Study to evaluate Safety and Immunogenicity of SII Inactivated Salk Polio Vaccine (Adsorbed) in comparison with SII Licensed Inactivated Poliovirus Vaccine (IPV)
Name of PI	Dr. Suman Kanungo, Scientist F, ICMR- NIRBI
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Sandip Mukhopadhyay, Scientist E, ICMR- NIRBI Dr. Agniva Majumder, Scientist- C, ICMR-NIRBI Dr. Shubarna Chakraborty, Scientist-B, ICMR-NIRBI
Funding Agency	Serum Institute of India Ltd.
Period	2023- 2025
Project Title	Pan-India antigenic characterization of dengue viruses: Early warning signal for a potential pandemic
Name of PI	Dr. Provash Sadhukhan, Scientist F, ICMR NIRBI, Kolkata
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Siraj Ahmed Khan, Scientist G, ICMR-Regional Medical Research Centre, Dibrugarh Dr. Harpreet Singh, Scientist F, Division of Bio-Medical Informatics, ICMR HQ Dr. Gajanan Sapkal, Scientist F, ICMR-NIV, Pune Dr. B. Anukumar, Scientist F, ICMR-NIV Kerala Unit Dr. Luke Hanna, Scientist F, ICMR-NIRT Chennai Dr. S.S. Mohanty, Scientist F, ICMR-NIIRNCD, Jodhpur Dr. Rituraj Niranjan, Scientist D, ICMR- NIRTH, Bhopal Dr. Rajeev Singh, Scientist D, ICMR-Regional Medical Research Centre, Gorakhpur Dr. Pramod Kumar, Scientist C, ICMR-NARFBR, Hyderabad
Funding Agency	ICMR Extramural
Period	March 2024 to February 2027
Project Title	Evaluation of the effect of influenza and pneumococcal vaccination on mortality and hospitalizations in the elderly - a randomized controlled trial.
Name of PI	Dr. Debjit Chakraborty
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Falguni Debnath, Dr. Agniva Majumdar, Dr. Sandip Mukhopadhyay, Dr. Saibal Das From MCH- Dr. Arup Chakraborty, Dr. Arunansu Talukdar
Funding Agency	ICMR
Period	05.03.2025 to 04.03.2028

Project Title	Assessment of comorbidity pattern, HIV care services and socio-behavioural dynamics among People Living With HIV/ AIDS in different geo-climatic regions: A mixed method exploratory assessment
Name of PI	Dr. Debjit Chakraborty, Dr. Alok Kumar Deb
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Agniva Majumdar, Dr. Falguni Debnath UNDP: Dr. Chiranjeev Bhattacharya WHO: Dr. Rajatshubhra Adhikary WBSAPCS: Dr. Rahul Biswas, Dr. Suman Ganguly, Dr. Debjani Guchhait IIT Kharagpur: Dr. Arista Lahiri GIM: Dr. Sreerupa Sengupta
Funding Agency	UNDP & WHO
Period	01.11.24 to 30.11.25
Project Title	Acceleration of TB Elimination in selected districts of India
Name of PI	Dr. Falguni Debnath
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Alok Kumar Deb Collaborators from ICMR- HQ
Funding Agency	ICMR
Period	07.05.2023 – 06.11.2025
Project Title	DLSS: Sentinel Surveillance for Tuberculosis burden in India 2023-2024" under the project strengthening and monitoring of Tuberculosis Elimination in India (Role:, Nodal officer for West Bengal)
Name of PI	Dr.Falguni Debnath
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr.Alok Kumar Deb; Dr. Sreeram, Dr. Mukesh from ICMR-NIRT CTD
Funding Agency	23.09.23 – 30.10.25
Period	
Project Title	Efficacy of newly isolated lytic *Shigella* phage cocktails on Shigella flexneri planktonic cultures and biofilms.
Name of PI	Dr. S. Basak
Funding Agency	ICMR
Period	2023-2026.
Project Title	Development of next generation drug library and information resource of the alternative therapeutic use of FDA approved drugs by Kernel-based machine learning integration of molecular structure, molecular activity and phenotypic data
Name of PI	Dr. S. Basak
Funding Agency	DHR
Period	2023-2026

Project Title	Exploring antimicrobial therapeutics against Multidrug Resistant enteric bacteria (MDR) causing sepsis from traditional plants of North East India: Addressing the problem of antimicrobial resistance.
Name of PI	Dr. Sushmita Bhattacharya, ICMR-NIRBI
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Indira S. Devi, DBT-IBSD Dr. Sulagna Basu, ICMR-NIRBI
Funding Agency	DBT
Period	2022-2024

Project Title	Anti-microbial Resistance Research & Evidence Synthesis for Stewardship Implementation And Surveillance Program Development Framework Assessment (amres)
Name of PI	Dr. Falguni Debnath
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Debjit Chakraborty, ICMR-NIRBI Dr. Sulagna Basu, ICMR-NIRBI
Funding Agency	ICMR
Period	2022-2025

Project Title	"Development of vaccine against *Helicobacter pylori* based on immunogen formulated from circulating prevalent strains"
Name of PI	Dr. Hemanta Koley
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Asish K. Mukhopadhyay
Funding Agency	ICMR
Period	3 years

Project Title	Novel cell penetrating Phosphorodiamidate Morpholino Oligomer based therapy for IBD targeting sphingosine kinase
Name of PI	Moumita Bhaumik
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Prof. Surajit Sinha Indian Association for Cultivation of Science, Kolkata
Funding Agency	DHR
Period	2024-2027

Project Title	Comparative assessment of immune responses following covaxin, covishield, sputnik-V and development of a novel vaccine candidate using doggybone/ (MIDGE) DNA encoding SARSCoV2-spike protein for employing alongside current vaccines in heterologous prime-boost approach in mice
Name of PI	Moumita Bhaumik
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Alok Chakrabartu (NIRBI) Santanabha Das (Diamond Harbour Women's University)

Funding Agency	ICMR extramural
Period (20-- to 20--)	2022-2025
Project Title	Molecular characterization of HIV to detect drug resistance mutations in the population of Eastern part of India
Name of PI	Dr. Agniva Majumdar
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Debjit Chakraborty
Funding Agency	ICMR
Period	2022 – 2025
Project Title	Setting up of Nation-wide Network of Laboratories for Managing Epidemics and National Calamities (VRDL)
Name of PI	Dr. Shanta Dutta
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Agniva Majumdar, Dr. Mamta C. Sarkar, Dr. Provash C. Sadhukhan
Funding Agency	DHR/ICMR
Period	2014 - continuing
Project Title	Pan India epidemiologic, virological and genomic surveillance for human influenza, CoVID-19 and RSV through DHR-ICMR VRDL network
Name of PI	Dr. Shanta Dutta
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Agniva Majumdar, Dr. Ananya Chatterjee, Dr. Sandip Samanta
Funding Agency	DHR/ICMR
Period	2021 – continuing
Project Title	Development of a sustainable network of laboratories in India for identification, monitoring and research on virus and bacteria causing acute encephalitis syndrome and other novel pathogens through capacity building in advanced biomedical technologies.
Name of PI	Dr. Shanta Dutta
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Mamta Chawla Sarkar, Scientist G Dr. Asish Mukhopadhyay, Scientist G Dr. Alok K. Deb, Scientist G Dr. Falguni Debnath, Scientist E Dr. Agniva Majumdar, Scientist D Dr. Surajit Basak, Scientist
Funding Agency	ICMR
Period	2023 – 2024

Project Title	Enhancing Infectious Disease Diagnosis Quality: External Quality Assurance Program for Hep A, E serology
Name of PI	Dr. Agniva Majumdar, Scientist D
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Srijita Nandi, PRS-II Dr. Ananya Chatterjee, Scientist C
Funding Agency	ICMR
Period	2024 – 2027

Project Title	Correlating antibiotic prescription patterns with resistance in commensal bacteria for one health-based stewardship intervention
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Santasabuj Das Scientist-G, ICMR-NIRBI, Kolkata Dr. Indranil Samanta Associate Professor Department of Veterinary Microbiology West Bengal University of Animal and Fishery Sciences, Kolkata (WBUAFS) Dr. Sulagana Basu Scientist-G, Microbiology Division ICMR-NIRBI, Kolkata Prof. Dr. Nupur Pal, Professor, Department of Microbiology, Prafulla Chandra Sen Govt. Medical College and Hospital, Arambag, W.B. Prof. Dr. Chitrita Chatterjee, Professor Department of Microbiology IPGMER, Kolkata Dr. Ripan Biswas Assistant Professor Department of Veterinary Pubic Health and Epidemiology, West Bengal University of Animal and Fishery Sciences, Kolkata
Funding Agency	ICMR Intramural grant
Period	08.3.2024-to 7.3.2027

Project Title	Computational screening and experimental validation of autophagy modulators against *H pylori* infection: a novel approach towards drug development.
Name of PI	Dr. S. Bhattacharya
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. S. Basak ICMR-NIRBI
Funding Agency	DHR Grant-In-Aid
Period	2022-2025

Project Title	Exploring antimicrobial therapeutics against Multi drug Resistant enteric bacteria (MDR) causing sepsis from traditional plants of North- East India: Addressing the problem of antimicrobial resistance
Name of PI	Dr. S. Bhattacharya
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. S. Basu , ICMR NIRBI Institute of Bioresources and Sustainable Development (IBSD), Department of Biotechnology, Govt. of India, Takyelpat, Imphal - 795001, Manipur, India
Funding Agency	DBT
Period	2022-2025
Project Title	Role of TFEB /ZKSCAN3 during H pylori infection and gastric cancer development-A possible therapeutic candidate
Name of PI	Dr. S. Bhattacharya
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	
Funding Agency	CSIR ASPIRE
Period	2024-2027
Project Title	Immune response to precautionary third dose of COVISHIELD/ COVAXIN among healthy adult population: an ICMR Cohort study, India
Name of PI	Dr. Suman Kanungo, Scientist F
Names of CoI /CoPI/ collaborators with name of collaborating institute(s)	Dr. Alok Kumar Chakrabarti, Scientist E Dr. Shubarna Chakraborty, Scientist B
Funding Agency	ICMR
Period	2022-2024

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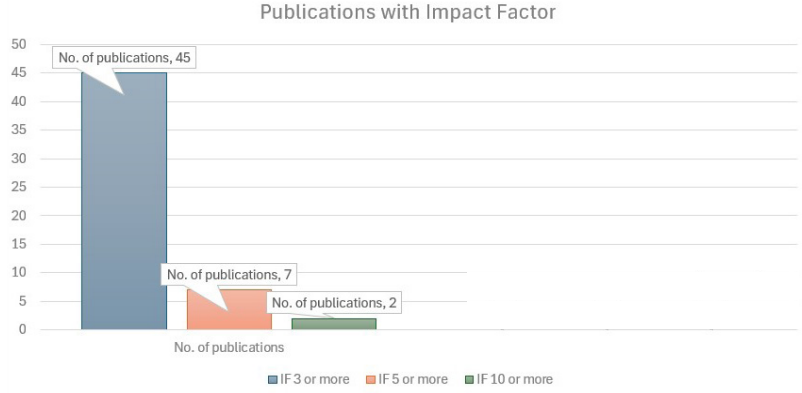
Book Chapter

- Sutripta Sarkara, Subrata Pal, Sunanda Chanda, Rajdeep Banerjeed, Sandipan Ganguly, Pradeep Das. Population Dynamics of γ- Proteobacteria during different phases of composting. Analytical Case Studies on Municipal and Biomedical Waste Management Perspectives on Sustainable Development Goals Edited By Moharana Choudhury, Ankur Rajpal, Srijan Goswami, Arghya Chakravorty, Vimala Raghavan Copyright 2025 CRC Press Taylor and Francis
- Koley, Nivedita & Koley, Hemanta. (2024). Extracellular Vesicles and Bacterial Infection. 10.1007/978-981-97-2494-9_5.



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Member	Dr. Alok Kr. Deb, Scientist G
Member	Dr. Asish Kr. Mukhopadhyay, Scientist G
Member	Dr. Sandipan Ganguly, Scientist G
Member	Dr. Sandipan Ganguly, Scientist G
Co-opted Member (for any requirement)	Dr. Sandip Mukhopadhyay, Scientist E
Nodal Person	Mr. Ramesha N. M., Sr. Admin Officer
Member	Mr. Abdul Latif, TA(ES)

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Member Secretary	Dr. Dipak Kr. Gayen, Section Officer

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Member	Mr. Suman Ghosh, TA (ES)
Member Secretary	Mr. Chandan Mandal, TO B

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Member	Administrative Officer
Member	Accounts officer
Member Secretary	Dr. Ranjan Kumar Nandy

Staff List

Scientists:

Dr. S. Dutta, Scientist G & Director (till Nov 2024)
Dr. S. Das, Scientist G & Director (joined on 27.12.2024)
Dr. A. Pal, Scientist G
Dr. R. K. Nandy, Scientist G
Dr. A.K. Deb, Scientist G
Dr. A. K. Mukhopadhyay, Scientist G
Dr. S. Ganguly, Scientist G
Dr. M. Chawla Sarkar, Scientist G
Dr. S. Basu, Scientist G
Dr. N. Chakraborty, Scientist F
Dr. H. Koley. Scientist F
Dr. S. Kanungo, Scientist F
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Mr. A. Ganai, Technical Officer
Ms. M. Mallick, Technical Officer
Mr. T. Barman, Technical Officer
Mr. S. De, Technical Officer-B
Ms. M. Das, Technical Assistant
Mr. R. Dey, Technical Assistant
Mr. A. Kool, Technical Assistant
Mr. S. Nandy, Technical Assistant
Ms. Y. P. Upadhyaya, Technical Assistant
Mr. P. Samanta, Laboratory Assistant
Mr. S. Dey, Laboratory Assistant-1 (posted at Pay bill section)

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Ms. M. Roy, Technical Assistant
Ms. S, Saren, Technical Assistant (joined on 08.07.2024)
Mr. K. K. Roy, Laboratory Assistant
Mr. K. G. Saha, Laboratory Assistant
Mr. A. Pramanik, Laboratory Assistant (posted at Bill Section)

Dr. A. K. Chakrabarti, Scientist F
Dr. P. Ghosh, Scientist E (joined on transfer on14.12.2024)
Dr. S. Mukhopadhyay, Scientist E
Dr. D. Chakraborty, Scientist E
Dr. F. Debnath, Scientist E
Dr. M. Bhaumik (Ghosh), Scientist D
Dr. S. Basak, Scientist D
Dr. P. Indwar, Scientist D
Dr. A. Majumdar, Scientist D
Dr. S. Bhattacharya, Scientist C
Dr. M. G. Lewis, Scientist C
Mr. R. Mukhopadhyay, Scientist C (joined on transfer on16.01.2025)
Dr. S. Chakraborty, Scientist B
Ms. Monica Sharma, Scientist B

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Mr. C. Mandal, Technical Officer-B
Mr. A. Chakraborty, Technical Officer -B (Posted at Personnel Section)
Ms. S. Pramanick, Technical Assistant
Ms. D. Sain, Technical Assistant
Ms. P. Bhir, Technical Assistant
Ms. D. Yadav, Technical Assistant
Dr. K. Dewangan, Technical Assistant
Ms. S. Pati, Technical Assistant

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Mr. K. G. Saha, Laboratory Assistant
Mr. A. Pramanik, Laboratory Assistant

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Ms. P. De, Technical Officer-B
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Ms. S. Mondal, Technical Assistant
Mr. S. Bhardwaj, Technical Assistant
Mr. Inbanathan A, Technical Assistant
Mr. A. Saha, Technical Assistant
Md Maruff Hossain, Technical Assistant
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Mr. P. Turi, Laboratory Assistant (retired on 30.04.2024)
Ms. C. Das, Laboratory Assistant

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Mr. D. Naskar, Technical Assistant (ES)
Mr. A. Latif, Technical Assistant (ES)
Mr. S. Mondal, Technical Assistant (ES)
Mr. S. Mukherjee, Technical Assistant (ES) (joined on 16.07.2024)
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Mr. S. Hazra, Laboratory Assistant
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Mr. B. Moshi, Laboratory Assistant (posted at Pension Section)
Mr. B. Hela, Laboratory Assistant
Mr. A. Seal, Laboratory Assistant-1
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Mr. N. G. Sutradhar, Laboratory Assistant

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Mr. B. Ganguly, Technician 2 (1st half duty)

PathophysiologyDivision
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Mr. B. Roy, Sr. Technician (1)

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Mr. T. Pal, TO-C
Mr. S. K. Routh, Laboratory Assistant

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Mr. S. Balmiki, Laboratory Assistant

Media Section:
Mr. K. Ghosal, Laboratory Assistant
Mr. S. Mondal, Laboratory Assistant

ICMR Virus Laboratory:
Mr. R. Hela, Laboratory Assistant (1st half)

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Mr. S. Naskar, Stenographer
Mr. R. Jaiswal, Upper Divisional Clerk
Mr. O. Lal, Laboratory Assistant (posted at Store Section)

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Mr. D. Kumar Gayen, Section Officer
Mr. S. Mullick, Assistant
Mr. A. Banerjee, Technician-2

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Mr. J. Malakar, Laboratory Assistant

Training & Extension:
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Mr. C. Mandal, TO-B
Mr. S. Majumdar, Assistant
Mr. A. Nag, Assistant

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Mr. P. Guha, Assistant
Mr. R. Kumar, Assistant
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Mr. R. Hela, Laboratory Assistant

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Pension Section
Mr. K. Sharma, Assistant

Vehicle Section
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Mr. R. Bhakta, Sr. Technician 3
Mr. S. Das, Sr. Technician 1
Mr. D. Dey, Technician 2

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Dr. Amit Kumar Chakraborty, Research Officer (HRRC Staff)
Dr. A. Chanda, Research Officer (HRRC Staff)
Dr. S. Saha Roy, Demographer (HRRC Staff)
Dr. A. Ghosh, J.C. Bose Distinguished Chair, Professor, National Academy of Science, India
Dr. T. Ramamurthy, INSA Sr. Scientist
Dr. P. Das, Emeritus Scientist

Staff Associated with ICMR-NIRBI
Mr. Nemai Das, Driver
Mr. Padma Lochan Nayak, Driver

Employees who Joined ICMR-NIRBI during 2024-25

Name of the Employee	Designation	Date of Joining	
Dr. Asish Debnath	Technical Officer-B	25.06.2024	
Ms. Sunayana Saren	Technical Assistant	08.07.2024	
Mr. Subhranil Mukherjee	Technical Assistant	16.07.2024	
Mr. Ramesha N M	Administrative Officer	18.09.2024	Joined on transfer from ICMR-NCDIR
Dr. Pramit Ghosh	Scientist E	14.12.2024	Joined on transfer from ICMR Hqrs
Mr. Rupam Mukhopadhyay	Scientist C	16.01.2025	Joined on transfer from ICMR Hqrs

Employees who retired from ICMR-NIRBI during 2024-25

Name of the Employee	Designation	Date of Retirement/ VR
Mr. Paru Turi	Laboratory Assistant	30.04.2024
Mr. Nemai	Driver	01.08.2024(VR)
Mr. Amit Kumar Chakraborty	Research Officer	01.09.2024(VR)
Dr. Shanta Dutta	Scientist G & Director	30.11.2024
Dr. Ananda Chanda	Research Officer	30.11.2024
Mr. Khokan Sen	Technical Assistant	28.02.2025

Obituary..... our tribute and homage.
"You will always be remembered.... rest in eternal peace."

Name	Designation	Date of Retirement/ VR	Passed Away on
Mr. Gunadhar Mohanty	Ex-Sr. Laboratory Assistant	31.12.2003	26.10.2024
Mr. Gora Chand Dhar	Ex-Section Officer	31.01.006	20.12.2024
Mr. Chittaranjan Pal	Ex-Sr. Technical Officer	31.10.2014	27.07.2024

ICMR - National Institute For Research In Bacterial Infections

Indian Council of Medical Research

P-33, CIT Road, Scheme-XM, Beliaghata, Kolkata-700010

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Designed by

Suparno Samanta

Student of Multimedia

St. Xavier's College, Kolkata