



ICMR
INDIAN COUNCIL OF
MEDICAL RESEARCH

NIRBI
NATIONAL INSTITUTE FOR
RESEARCH IN BACTERIAL INFECTIONS

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GYAN-e: ICMR-NIRBI e-NEWSLETTER

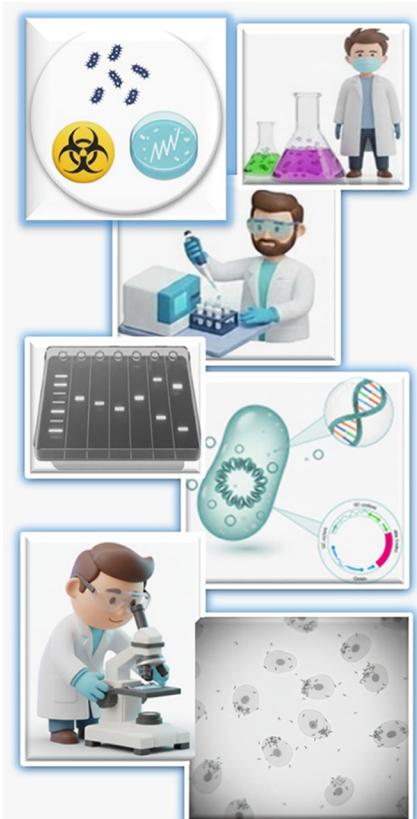
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Human life around the globe has recently emerged from the COVID-19 pandemic. Today we are much better prepared to face future pandemics, but a different type of infectious diseases, predominantly caused by antibiotic-resistant bacteria are silently, but rapidly taking its toll on human lives. The situation might be aggravated by widespread and indiscriminate use of antibiotics during the pandemic period. While this 'simmering epidemic' is a global phenomenon, its impact is most devastating in the overcrowded, developing countries of the South with relatively poor healthcare infrastructure and low public health awareness, such as in India. This is further contributed by the unavailability of affordable diagnostics and antibiotic susceptibility testing (AST) for bacterial infections, in addition to improper prescriptions and over the counter sale of antibiotics.

India has embarked on the National Action Plan on AMR (NAP-AMR) 2.0 after completing the first 5-year phase (2017-2022), but antibiotic stewardship and routine AST are still limited to the tertiary healthcare facilities. While some improvement in the antibiotic prescription practices has been noticed recently in the referral hospitals, lot more is urgently required, especially at the district and village levels to change the dynamics of the spread of AMR. Responding to this need, ICMR took the bold and deterministic decision to convert ICMR-NICED, Kolkata to ICMR-NIRBI in May 2024 with the expansion of the research mandate to include all bacterial infections of the humans, while phasing out activities on viral and other pathogens. To develop NIRBI as the apex research institution of the country for bacterial AMR, an AMR Hub was established back in September 2019, which is not only providing training and services to the researchers across different states, but also the well-characterized clinical isolates of multi-drug resistant bacterial pathogens.

The new institute is emphasizing on exploiting its basic research to the development and commercialization of rapid, affordable and point of care diagnostics as well as new drugs and vaccines for bacterial infections. One qPCR-based kit for the detection of four common viral aetiologies of acute diarrhoea was handed over to the industry for commercialization. Technologies for developing candidate vaccines against *Salmonella* and *Shigella* infections were also transferred to the companies recently for further development. Scientists of the institute are actively working on designing and developing bacteriophage- and monoclonal antibody-based therapies for two critical MDR pathogens, *Pseudomonas* and *Acinetobacter*, respectively. Several projects are also underway to develop real-time PCR kits for the syndromic diagnosis of acute fever and sepsis as well as to identify the diagnostic biomarkers for urinary tract infections.

With the above goals in mind, new collaborations have been established with OSAKA University, Japan and THSTI, Faridabad, while talks are underway with Karolinska Institute, Sweden, IIT Kharagpur and three institutions from Kolkata, namely Bose Institute, Presidency University and Bangur Institute of Neurosciences. A meeting was held with the Principal Secretary of Health, Government of West Bengal to forge closer and stronger ties to jointly address the problems of AMR at all three tiers of the state health system. The institute is actively and enthusiastically preparing to celebrate the foundation day in February, 2026 by commemorating the landmark contributions of Dr. Dilip Mahalanabis to the development of Oral Rehydration Therapy (ORT) and organizing a national level symposium on 'Bacterial Infections and AMR'. Stepping into the new year, NIRBI is determined to contribute significantly to the fight against severe bacterial infections and AMR through research as well as training and services.

(Dr. Santasabuj Das)

Upcoming Events

- Strengthening Capacity To Combat Foodborne Pathogens: An Integrated Approach to Food Safety - A five-day workshop

Date: 3-7 February 2026

- Celebration of 64th Foundation Day.

Date: 18 February 2026

Outbreak Investigations

- Outbreak of Guillain-Barré Syndrome (GBS) in Pune City between January and March 2025.
- Acute Diarrheal Disease outbreak Jajpur, Odisha from 14 to 21st June, 2025.

Policy Paper / Guidelines

- Launch of a Policy Paper on Environmental Priorities for AMR Action in India by United Nations Environment Programme (UNEP), based on ICMR-NIRBI's work.
- Contributed to the WHO Guideline on *In vitro* diagnostic tests for serious bacterial infection, including neonatal sepsis, among infants aged 0–59 days (target product profile).

2025 : A Year of Achievements

Technology Transfer

A broad-spectrum glycoconjugate vaccine candidate effective against both typhoidal and non-typhoidal *Salmonella* strains and an outer membrane vesicle-based *Shigella* vaccine candidate transferred to the vaccine manufacturers for further development and commercialization.

Novel Diagnostics & Therapeutics

- Development of a multiplex PCR assay (single step) to differentiate hypervirulent and classical *K. pneumoniae* -- Patent filed in collaboration with ICMR.
- Multiplex 2 tube real-time RT-PCR Assay for detection of enteric viruses (En-Viro QPlex) kit received The Silver Award at the 2nd DHR-ICMR Health Research Excellence Summit 2025 under the category Innovation Excellence Recognition: Technology-Intramural.
- A new bacteriophage cocktail was developed and its safety and efficacy to disrupt a polymicrobial biofilm of *Shigella* and *Salmonella* spp shown.
- Therapeutic potential of a novel *Shigella* Phage SSG23 against *Shigella sonnei* biofilms and infection in BALB/c mice demonstrated.



Smt Anu Nagar, Joint Secretary, Department of Health Research, Govt of India along with her team visited on 14th July 2025.



Preconference workshop of HOPECON 25

ICMR-NIRBI, Kolkata and MRU, Medical College & Hospital, Kolkata organized "Preconference Workshop of HOPECON '25", themed: 'AMR: Research-Clinic Synergy - A Path to Wellness' on 24th June 2025 at Mother & Child Hub Building, Medical College & Hospital, Kolkata.

This workshop aimed to foster collaboration between research and clinical practice in addressing antimicrobial resistance (AMR), to advance public health and wellness. Inaugural address was given by Dr. Indranil Biswas, Principal, MCH Kolkata and Chief Guest, Dr. Apurba Mukherjee, President HOPECON '25 and Dr. Santasabuj Das, Director, ICMR-NIRBI.

Dr. Sulagna Basu, ICMR-NIRBI presented on "AMR Research Journey of ICMR-NIRBI".

Dignitaries Visiting the Institute

- Prof. Forest Rohwer, Department of Biology, San Diego State University, delivered a talk on "Bacteriophage Adherence to Mucus (BAM) immunity" on 12th December, 2025.
- Dr. Ranjit Ray, Professor, Saint Louis University, Division of Infectious Diseases, Allergy & Immunology, Edward A. Doisy Research Center, St. Louis, MO delivered a talk on "Modified hepatitis C virus envelope glycoprotein-mRNA-LNP as a candidate vaccine" on 5th December, 2025.
- Dr. Shinji Yamasaki, INSA Overseas Chair, Professor of Laboratory of Veterinary International Prevention of Epidemics, Department of Veterinary Science, Vice Director of Osaka International Research Center for Infectious Diseases, Osaka Metropolitan University, Japan delivered a talk on "Escherichia albertii is a newly emerging zoonotic pathogen" on 10th November, 2025 at ICMR-NIRBI.
- Dr. Sudipto Halder, Research Director, Agrivet Research & Advisory Private Limited, Kolkata delivered a talk on "Animal Agriculture and the AMR Crisis: Understanding Links, Misconception, and Pathways to Sustainable Solutions" on 16th October, 2025.
- Dr. Rajendra Deora, Division of Microbial Infection and Immunity, Dept. of Microbiology, Ohio State University, USA delivered a talk on "Animal and Human-mimic Models of Bacterial Pathogenesis and Biofilm Development" on 11th September, 2025.
- Dr. Rhishita Chourashi, Senior Postdoctoral Fellow, Oglesby Lab Department of Pharmaceutical Sciences, University of Maryland, Baltimore delivered a talk on "Iron starvation causes sRNA dependent switch from acute to chronic infection, a rising cause of AMR in *Pseudomonas aeruginosa*" on 26th August, 2025.
- Dr. Soma Chattopadhyay, Scientist F, BRIC-Institute of Life Sciences delivered a talk on "Development of anti-viral molecules against Chikungunya and other RNA viruses" on 11th August, 2025.
- Dr. Anirban Mahapatra, Editorial Director, American Society for Microbiology (ASM) delivered a talk on "Microbes in Infection and Beyond" on 31st July, 2025.
- Dr. Anjan Debnath, Associate Adjunct Professor, University of California, San Diego Skaggs School of Pharmacy and Pharmaceutical Sciences, Center for Discovery and Innovation, California, USA delivered a talk on "Repurposing and Deep Diving: Lab- and Sea-based Molecules for the Treatment of Gastrointestinal and Brain Infections" on 4th July, 2025.
- Dr. Puja Majumder, Postdoctoral Research Associate, Memorial Sloan Kettering Cancer Center, New York, USA delivered a talk on "Bacterial defense strategies: against antibacterial drugs and bacteriophages" on 30th April, 2025.
- Dr. Tushar Maiti, Professor, Regional Centre for Biotechnology, Faridabad delivered a talk on "Importance of Proteomics in Biomedical Research and Clinical Applications" on 17th April, 2025.
- 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.
- Dr. Wriddhiman Ghosh, Professor, Geomicrobiology Laboratory Department of Biological Sciences, Bose Institute delivered a talk on "Obligately aerobic life in a sulfidic (anoxic) habitat" on 23rd January 2025.
- 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.

First Reported

Avian Influenza A (H9N2) human infection — second ever H9N2 human case in India.

First identification of *Entamoeba moshkovskii* as pathogen (3 % diarrhoeal cases, India).

Co-existence of bla_{NDM-1} and bla_{NDM-5} in *ST167/ST101* documented under AMR surveillance.

MOU Signed With

Osaka University, Osaka, Japan to implement the HMSC approved project titled “Assessing genetic diversity of *Vibrio cholerae* using cloud computing and developing potential therapeutics against cholera”.

Infrastructure

A state-of-the-art Bio-repository of antibiotic-resistant bacterial strains is functional and sharing the strains with different institutions across India.

Strategic Meeting on AMR

ICMR-NIRBI had a strategic meeting on containment of AMR with West Bengal State Health, chaired by Hon'able Principal Secretary, DHFW, Govt. of West Bengal on 17.12.2025.



Research Brief - Publication

ICMR- NIRBI released a research brief “Evidence Based Policy Recommendation For Climate Responsive, Inclusive HIV / STI / NCD Care” based on a collaborative study with WBSAPCS, jointly funded by UNDP and WHO at WBSAPCS on 18.12.2025.



Awards/Honours Received

Students presenting poster/delivering oral presentation in the Immunocon 2025, the 52nd Annual Conference of the Indian Immunologic Soceity, received first and second award.



Research scientists/students won prizes @Biospectrum2025 and showcased scientific excellence on an international platform.



Outbreak Investigations

Scientists from ICMR-NIRBI, Kolkata and ICMR-NIV, Pune jointly investigated a large community outbreak of **Guillain–Barré Syndrome (GBS)** in the Pune City between January and March 2025 that caused 230 GBS cases and 12 deaths. *Campylobacter jejuni* was identified as the etiological agent for the outbreak.

Scientists of ICMR-NIRBI as part of a Central Team visited Jajpur, Odisha from 14th June to 21th June, 2025 for comprehensive assessment of an **Acute Diarrheal Disease** outbreak and to provide assistance to the State Government for public health measures, management guidelines, protocols etc. *Vibrio cholerae O1*, Ogawa was identified as the etiological agent for the outbreak.

Publications in High Impact Journals

Basu S, Singh AK. Mitigating antimicrobial resistance, a critical step towards saving newborns: still miles to go. Lancet Global Health. 2025 May; 13(5):e783-e784.

Maitra P, Bhukta S, Gope A, Kayet P, Basak S Miyoshi SI, Kitahara K, Dutta S, Bhattacharya S. Asiatic acid, a novel ciprofloxacin adjuvant inhibits *Shigella flexneri* infection. Gut Microbes 2025 Dec 31; 17(1): 2586329.

Hoque M, KimDR, Ahmed F, Islam MT, Im J, Tadesse BT, Kang S, Khanam F, Chowdhury F, Ahmed T, Firoj MG, Aziz AB, Kanungo S, Khan AI, Khan MA, Lee J, Pak G, Marks F, Kim JH, Azman A, Homgren J, Qadri F, Zaman K, Clemens JD. Protection by natural cholera against later episodes of cholera over 10 years of follow-up in Matlab, Bangladesh : a retrospective cohort study. Lancet Microbe. 2025 Mar;6(3): 100981.

Singh DP, Bijalwan V, Poonam J, Lal R, Palkhade R, Viramgami A, Vidhani H, Kumar A, Bishnoi M, Das S. Bisphenol-A at an environmentally plausible dose caused gut microbiota impaired cognitive performances in adult mice. J Hazard Mater. 2025 Nov 5;499:140254.

Our Aim

R: Research
E: Excellence in
A: AMR & Address
C: Community
H: Health Issues

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Unveiling the bust of **Dr. Dilip Mahalanabis, Father of ORS, Padma Vibhushan**
on the Foundation Day celebration on
18th February 2026

Dr. S. C. Pal Oration Lecture by Prof. P. Balaram
Former Director, I.I.Sc. Bangalore
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Chairperson, ATREE

Upcoming Workshop on Strengthening Capacity to Combat Foodborne pathogens

