भारतीय आयुर्विज्ञान अनुसंधान परिषद
स्वास्थ्य अनुसंधान विभाग, स्वास्थ्य एवं परिवार
कल्याण मंत्रालय, भारत सरकार

Indian Council of Medical Research
**Department of Health Research, Ministry of Health
and Family Welfare, Government of India**

ICMR
**INDIAN COUNCIL OF
MEDICAL RESEARCH**
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Date: 10-10-2023

Request for Expression of Interest (EOI)
To establish ICMRs Genomic Surveillance for Antimicrobial Resistance

Overview

Antimicrobial resistance (AMR) poses huge threat to the healthcare systems across the globe and plethora of efforts are directed to deal with it. ICMR has an Antimicrobial Resistance research and surveillance initiative and publishes trends of AMR in the country annually. ICMR also undertakes genotypic characterization of key pathogens and reports prevailing mechanisms of resistance. While Low- and Middle-income countries (LMIC) experience the most significant burdens of antimicrobial resistance (AMR), it's worth noting that there is a scarcity of comprehensive data available from these regions on public databases. The data available so far is not sufficient for identifying novel mechanisms of resistance and for understanding transmission dynamics. Genomic technologies have enabled monitoring of the AMR and discovery of unknown mechanisms of resistance. These technologies have also allowed source-tracing of AMR pathogens and augment understanding of AMR evolution and transmission. ICMR acknowledges that the gaps in genomic information concerning AMR pathogens in India are primarily attributed to limited sequencing and bioinformatics capacity.

Development of antibiotic resistance is a "normal" adaptive response of bacteria and is a continuous evolving process. One of the classical examples of new resistance mechanism is of Metallobeta-lactamase NDM, which emerged among several gram-negative bacilli. Emergence of such resistance mechanisms can render powerful antibiotics ineffective, which are often used as last line of defense against multi-resistant strains of bacteria. Another example is the emergence of multi-resistant Enterobacteriaceae due to the production of extended spectrum β-lactamases (ESBL) which have become very common in India. Understanding of the mechanisms of resistance to antimicrobials is of paramount importance to design novel strategies to counter the resistance threat. Therefore, efforts to study mechanisms of resistance should be continuous and steady.

It is well documented that antimicrobial use (AMU) in animal production and livestock is another important factor contributing to the crisis of AMR. In low and middle-income countries (LMIC), where controls of AMU in veterinary practice and human health are less rigorous, it is vital to understand transmission dynamics of AMR across multiple sectors. Therefore, research on the impact of antimicrobial residues in the environment and animals on AMR in humans and vice versa is needed to understand the origin and directionality of transmission of AMR in both bacteria and fungi.

ICMR plans to initiate genomic surveillance to promote understanding of mechanisms of resistance (known and unknown) and transmission dynamics of the priority pathogens (Antimicrobial Resistance Research and Surveillance Network, Annual Report, ICMR, 2020[1] & 2021[2]) by involving centers

1. https://main.icmr.nic.in/sites/default/files/guidelines/AMRSN_annual_report_2020.pdf
2. https://main.icmr.nic.in/sites/default/files/upload_documents/AMR_Annual_Report_2021.pdf

dedicated to perform this task. The institutes with a well established facility to perform whole genome sequencing (WGS)/Next generation sequencing (NGS)/metagenomics, data analysis and also computational infrastructure with access to clinical, livestock, veterinary and environmental isolates shall be preferred. It will be preferable to have centers with a multi-disciplinary team consisting of microbiologists, clinicians and bioinformaticians. The selected researchers shall be invited to develop a full research proposal and roll out the research project under the guidance of ICMR, Hqrs. The process of development of protocol and research project implementation shall be reviewed by an expert group constituted by ICMR.

Objectives
- Employing WGS/NGS/metagenomics to study the mechanism of resistance to antibiotics (known and unknown)
- Deciphering WGS/ NGS/metagenomics data for understanding of AMR evolution, transmission dynamics and spread, inform control strategies, facilitate the detection of new and emerging threats.
- Correlation of *in vitro* (phenotypic methods and AST) data with WGS across pathogens
- Utilizing One Health approach to promote understanding of AMR at animal-human-ecosystem interface
- Identifying targets for new antimicrobial agents and development of diagnostic modalities

ICMR invites EOIs proposals that address the below-mentioned research question

Priority Research Question
Can genomics approach help in understanding of mechanisms of resistance, transmission dynamics of the priority pathogens and identifying the targets for new therapeutic agents?

Expected Outcomes
- Identification of AMR/MDR/XDR strains and detection of novel molecular markers of drug resistance
- Faster real time surveillance across different sectors including Humans, animals/livestock & environment
- Tracing of microbial transmission events and rapid, accurate identification of local, regional outbreaks
- Contribution to comprehensive genome databases
- Improvement in clinical care by facilitating development of local/hospital antibiograms
- Facilitation of development of targeted diagnostics and novel antimicrobial treatments

Who can submit the EOI?
The EOI can be submitted through ONLINE MODE ONLY by scientists/ professionals who have regular employment in Medical Institutes/ Research Institutes/ Universities/ Colleges/ Government and semi-government organizations (documentary evidence of their recognition including a DSIR certificate

should be available). Collaborations with IITs, VIT, BITs etc as bioinformatics partner will be encouraged.

Points to be kept in mind while submitting the EOI
1. The EOI must address the specific research question that is mentioned in the call text
2. Projects with collaborative, multi-centric, interdisciplinary and innovative approaches will be preferred
3. Should focus on outcomes that are translatable into policy
4. Foreign collaboration is not allowed under the call

Format of Expression of Interest (EOI) to be submitted

A. Name of the Senior Researcher (Principal Investigator):

B. Name of the institute:

C. Address with email id and phone no. of PI:

D. Type of Organization:

Government
Private
Non-Government Organization

E. List of publications in last 7 years (since 01-01-2017)
In prescribed format (Annexure-I) for PI/CoPIs proposed for study should be included, where she/he was the First/last/ corresponding author). Highlight impact of each publication e.g. inclusion in policy/protocol/programme or being cited in patents/commercialisation of results etc.

G. List of research projects undertaken in last 5 years (since 01-01-2019) in prescribed format (Annexure- II)

I. Collaboration with ICMR or contribution to ICMR activities in last 5 years (maximum 250 words).

J. Rationale of proposed study including the choice of sites (states and districts) to be included where the implementation shall be carried out
The proposal should clearly state the rationale for the study, the recommended sites which are likely to be relatively more vulnerable due to reasons of geography; socio-economic or cultural disadvantage; may be preferentially included.

K. Implementation Strategy

Provide a clear and detailed description of the proposed study including details of the pathogens and collection of samples. You should also include steps of implementation, a timeline, methods of data analysis, data management and deliverables. PI must provide justification of the collaboration proposed in this project

L. Address feasibility and scalability
Address the feasibility of the proposed study, including availability of the resources needed for implementation (Instrumentation, computational infrastructure etc), the capacity of the implementing organization, and the potential for wider adoption and scale-up.

M. Research Team
Summarise and justify the composition of the proposed research team, based on the expertise of the individual team members in designing and implementing the project. Also, highlight the skill set and expertise the members shall bring to the research team that shall be constituted by the ICMR Hqrs for the development of final protocol and research project implementation.

N. Any ongoing National/International collaborations relevant to the call

N. Illustrative Budget outline (additional to the 2-page limit)
The final site budgets for the proposal will be developed by the selected research team(s) under the guidance of ICMR. In this EOI, provide an estimated budget outline (no budget justification required at this stage) under the following headings: staff, recurring contingency, data management, travel and equipment.

O. One-page CV of the principal investigator and other key investigators (additional to the 2-page limit)
Please provide a one-page CV of the PI and other key investigators from each identified area. Each CV should include:
- Academic and professional qualifications

- Current position and affiliation

- Up to five most relevant previous research grants

- Upto five most relevant previous publications

- Experience in undertaking projects on immunization from the public health perspective

Review process:
The EOI documents for the ICMR's Study on genomic surveillance for AMR will be evaluated by the Indian Council of Medical Research (ICMR). The ICMR team will screen the applications for technical accuracy and eligibility. The shortlisted teams will then collaborate to develop a detailed proposal, under the guidance of ICMR Hqrs. The proposal will be evaluated based on factors such as study design, feasibility, data management capabilities, prior experience and potential for value addition to the existing knowledge. The feasibility and suitability of integration of the proposed methodology in the final proposal to be developed under the guidance of ICMR Hqrs shall also be considered while shortlisting the EOI.

Interested parties should fill out the Google form at the below link and submit an **Expression of Interest (EOI)** as per the Format given above. Only shortlisted PI will be contacted

Link- https://forms.gle/A3qGVwmCc6f2dMH6A

Timeline

Activities	Date
Release of Call	10th October, 2023
Last date for submission of EOI	15th November, 2023
Shortlisting of EOIs	15th December, 2023
Proposal Development Workshop	15th January, 2024
Submission of a full proposal	15th February, 2024

For any queries related to the call, please contact:
Dr. Kamini Walia,
Scientist G,
ECD Division, ICMR Headquarters,
V Ramalingaswami Bhawan, Ansari Nagar, New Delhi-110029
Email: icmr.amrdx@gmail.com

Annexure-I (list of publication since 01-01-2017)

Title of publication in AMA style	Impact factor of journal	Name of policy/programme/ protocol document or patent/commercialisation of products where cited.

Annexure-II (list of projects since 01-01-2019)

Short title of the project	Primary objective (in brief)	Type of study (e.g. RCT / Prevalence/Lab-based)	Sample size	Grant amount	Time period