

AN E-MAIL INTERVIEW WITH

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Dr. JAGADISH MAHANTA, The Distinguished Scientist Chair of Indian Council of Medical Research was the Former Director, Regional Medical Research Centre for NE region of ICMR. A graduate from Guwahati Medical College, passed MD with Merit of First order from PGIMER, Chandigarh. He joined RMRCNE as Director in 1996 and served till 2015. He is a Fellow of Royal Society of Tropical Medicine and Hygiene, London; Indian Academy for Parasitology and Indian Academy of Tropical Parasitology. Some of his National awards include, Annual Oration award of Indian Society for Malaria and other communicable diseases, ICMR award for excellence in Research in NER, SC Parija Oration award Indian Academy of tropical Parasitology, PC Mahanta Oration award of Indian Association of Medical Microbiology, Cancer foundation of India, Oration Award of BBCL. He represented Indian Society for parasitology in World Federation of Parasitologists, from 2002 to 2006. He was one of the expert reviewer of Millennium Development of Ecosystem, launched by United Nation. He served as the Member of Governing body and Executive council of ICMR, Management council B. Barooah Cancer Institute, Vice president Indian Academy of Parasitology (2002-2005), Vice -President of Assam Science Society (1993-94), Member, Scientific Advisory group for Non Communicable and communicable diseases of Indian Council of Medical Research and member of Scientific Advisory committee of several ICMR institutes. He published > 575 research papers in reputed National and International journals and guided several Ph. D. students of different Universities.



Editor: Sir, as you are a Scientist of eminence, I would like to request you to edify on the development of education and research in India based on the following framed inquiries for greater interest of researchers working in the fields of Pharmaceutical, Medical, Biological and Biomedical sciences.

1. Which particular factor has motivated you to research?

Answer: While associated with clinical practice, I often noticed the limitation of our knowledge about the extent of existing diseases, therapeutic alternatives, development of new diagnostics, drugs and development of models for experimenting and developing new molecules. This was the prime force which inclined me towards medical research.

2. You have been associated with RMRC, Dibrugarh; would you please highlight the research activities at RMRC, Dibrugarh?

Answer: Regional Medical Research Centre was created in the line of Regional Research laboratories of Council of Scientific and Industrial Researches all over the country to focus more attention towards regional health problems along with national priorities. Accordingly Regional Medical Research Centre for Northeastern region was established in 1982, with a mandate to develop modern research capabilities in 8 northeast states and to develop human resource for cutting edge research. Accordingly several divisions were gradually started to establish research in communicable diseases caused by bacteria, virus, fungi and parasites along with its transmitting vectors; non-communicable diseases like cardiovascular diseases, metabolic disorders like diabetes and cancer; nutritional disorders, blood disorders, unconventional food and food supplements; exploration of traditional knowledge and drug development. Initially started with estimation of disease burden to set priorities and then to study pathogenic mechanism, disease susceptibility of hosts. Works on genetics and molecular mechanism was started for deeper understanding of disease process, personalized treatment and prevention. For development of human resource and strengthening medical colleges for early diagnosis and management, chain of facilities were established through Department of Health Research and Indian Council of Medical Research. Effort to create state of art animal facility at ICMR-RMRCNE for experimentation has also been initiated.

3. RMRC is actively involved in controlling parasitic diseases in northeast India, how effectively RMRC is implementing the policies?

Answer: People of NE region is facing perineal problems of parasitic diseases like Malaria, filariasis, intestinal parasites, and foodborne parasitic diseases. Isolated focus of Kala-azar has also been identified. Many of them are transmitted by vectors. Therefore, the dual problem of pathogen and their vectors complicate the challenge of control. From its inception ICMR-RMRCNE is concentrating on studying epidemiology of the disease, parasite behavior, drug sensitivity, suggesting change of drug policy for National program, surveillance and epidemic prediction. Development of laboratory to do continuous parasite culture for anti-malarial drug assay and other molecular techniques was added in the list of priority.

In vector research, besides studying evolution and spread of vector in Southeast Asia, mapping of mosquito vectors, their insecticide susceptibility monitoring, parasite transmission potential, strategy for preventing man mosquito contact and dynamics have also been studied.

ICMR-RMRCNE has done pioneering work to find out the extent of food borne parasitic infection specially Paragonimus and Paragonimiasis in NE region. Work on complete biology, lifecycle, identifying new strains of Paragonimus has been appreciated by scientists across the globe. We have developed animal models for studying biology and trying anti parasitic drugs. Further, we could develop diagnostic kits and demonstrate the simple measures to control the disease in the community.

4. What initiatives RMRC are taking in expanding research in northeastern region of India?

Answer: ICMR-RMRCNE is a multi-disciplinary institute with various benches with different specialization. Beside parasitic diseases, attention has been directed to develop state of art facility (BSL laboratory), acquire modern equipment and train doctors and scientists to diagnose and isolate (few) encephalitis causing viral disease like Japanese encephalitis, West Nile infection, Nipah virus infection, virus causing respiratory infection like Influenza, Parainfluenza, Rhino, Corona; other virus like mumps, measles, chicken pox etc. During the process of enhancing the capability to diagnose and monitor viral diseases in the region, Medical Colleges and big hospital in

some states, a chain of Viral research and diagnostic laboratories across all the 8 states of Northeast region has been established through Department of Health Research/ICMR. Further, a central Regional Viral Research and Diagnostic Laboratory at ICMR-RMRCNE campus with capability for isolation of some virus and to supplement state laboratories has also been started. These laboratories are becoming handy in tackling diagnostic services in during epidemic situation.

Laboratory capability has also been expanded to isolate, diagnose and monitor drug resistant bacterial pathogen including Rickettsia, and fungi.

Besides communicable diseases, this centre has expanded to do advance research in cardiovascular diseases, nutrition, haemoglobinopathy and blood disorders, and cancers. Burden of various cancers in this region has been brought to light through epidemiological research by establishing Population Based Cancer Registries across the region. Documentation of high incidence of some cancers in the region attracted the attention of Government, and led to the decision to establish several cancer care hospital across Assam and the region.

High prevalence of Hypertension was also highlighted by research, and development of simple module to control hypertension by salt intervention attracted the attention of planner to implement the strategy.

Exploration of traditional medicine, behavior and use of unconventional food, prevalent in different communities was a part of expanded areas of research. Its nutritional value, use as nutrition supplement is another area in its agenda.

5. What is your comment on the trending status on research in parasitology and the application of research output in India and what should be done urgently for improvement?

Answer: India is in the process to eliminate many parasitic diseases including filariasis, malaria in some parts, Kala-azar and paragonimiasis. All efforts are being focused towards elimination/control of the above parasitic diseases in India. Research output and experience in NE region will add to the development of strategy in controlling parasitic diseases in difficult areas of the country. Integrated multidisciplinary approach has been adopted to control and eliminate these parasitic diseases in time bound manner. Looking into the financial commitment, delineation of hotspot, with prioritization of control measures to have maximum impact on reduction of case load will hold the

key to success. This process will enrich the experience, increase confidence and acceptability to plan for elimination.

6. As a researcher, would you please comment on the changes required for product oriented research carried out in academic institutions and anticipated role of authorities including funding agencies.

Answer: Academic institutions are the hub of scientists and scholars and is the best place to carryout research, and their achievements add feather to the institution. For academic institutes located in NE region, nature is offering tremendous opportunity for developing products from its resources. With the competitive trend in science one is judged by their visibility in publication and possession of intellectual property in the form of product and process. Prosperity and mutual development of many universities or academic institutes across the globe have come up with industry-academia interaction and industries are attracted to academia via visibility and development of marketable products or process. This has three pronged benefits viz: Brings financial support for academia, attract young talents to academic institutes and help in post accomplishment employment. Therefore, policy planners of academic institutes should have a clear strategy for funding to establish modern infrastructure, product oriented research and training in IPR, good Laboratory Practice and quality control in academic institutes.

7. According to you, what would be the guiding principles for utilization of natural resources of northeast India for prospective Anti-Corona or similar antiviral Drugs?

Answer: In the past, very few novel therapeutic molecules have been developed. Northeastern region is the hub for medicinal/aromatic plants and people use many unconventional food. Active principles of many plants and herbs are now in public domain. Pharmacologists and scientist with bio-informatics background should quickly screen the potential molecules for anti-viral or Anti-corona activity and selectively do the trials.

The unconventional food and edible plants with high nutraceuticals value or immune enhancement property should be catalogued and evaluated quickly and put on clinical trials.

Developing infrastructure, building capacity to study bioavailability,

pharmacodynamics and pharmacokinetics of existing active principles will open the gate for drug research.

We should create GCP/GLP facility for clinical trial of these compound from natural resource. This will add value of natural products and increase acceptability across the globe.

8. To what extent you believe that the current pandemic COVID-19 has put researchers in stress.

Answer: I feel the present pandemic of COVID-19 stressed researchers on various facets across the globe.

- a) First and foremost, to quickly develop diagnostics to detect the cases and therapeutics to reduce mortality and morbidity in the patients.
- b) Understand mode of transmission, potential and dynamics of transmission the virus and survival in environment.
- c) Understand the host susceptibility/immunity and pathogenesis with the new virus.
- d) Prevention of viral transmission in different settings and development of appropriate vaccine for long term prevention in future. However, I feel even after development of vaccine, viral mutation and acceptability in community and coverage will be a challenge.
- e) Silver lining among the challenges is DHR/ICMR has already created a network of viral Diagnostic and Research Laboratories across the country. Particularly in Northeastern region we started the process to create such laboratories in medical colleges of the region to handle various emerging viral diseases, almost a decade back. This has eased the stress to some extent. Now we are equipped to a great extent to monitor and diagnose such emerging viral diseases.

9. From your experience, would you please suggest a plan to train up health professionals including non-technical persons associated with health sector to effectively work during any such future pandemic?

Answer: In pandemic/epidemic of emerging and re-emerging diseases though training and orientation of doctors, nurses, technicians, molecular biologists,

paramedical workers and other care givers as front line worker, is of paramount importance yet other personals like cleaners, social workers, counselors, psychologists etc. also need orientation and training.

There should be orientation and interaction with engineers and technocrat to develop infrastructure and protective kits to prevent disease.

Besides the health care providers, community leaders, key opinion makers, religious leaders, media personnel, administrators also need training for smooth handling of pandemics at community level.

10. Due to global warming, what are the risk factors from permafrost pathogens?
11. **Answer:** Global warming has the potential of activating permafrost pathogen. However, before such occurrence, even existing pathogen and insect vectors will have higher fecundity and regeneration. This will increase the pathogen transmitting potential and will cause havoc of vector borne diseases.
12. What strategic plan or policy should be adopted or what specific modification(s) of existing health policies you would like suggest in improving efficiency in the management of future pandemic(s)?

Answer: There should be a surveillance system manned by trained public health professionals, physicians, veterinarians and biologists to suspect cluster of diseases (in human, animals) with novel symptoms of emerging diseases for taking early containment and control measures to warn all stakeholders to prevent it before assuming epidemic or pandemic nature.

Since most (>80%) of the dreaded emerging and reemerging pandemics (Viral or bacterial) are zoonotic in nature; for early detection and containment, coordination among different scientists under one health system for quick dissemination of information and share facilities to prevent wider spread and fatalities.

Creation of network of laboratories with trained technicians and scientists to detect, isolate emerging pathogen and surveillance mechanism to forewarn reemergence of existing pathogen is essential.

During epidemics mortality and spread of diseases become the main concern among the people. For management of such epidemics, adequate numbers of containment and treatment facilities manned by trained doctors and

paramedics should be created to prevent case fatality and spread.

13. As an eminent Scientist, what is your message to young researchers of India of Pharmaceutical, Biomedical and allied sciences?

Answer: In the past few decades world has witnessed development of very few novel molecules. Besides developing new therapeutic molecules or identifying new compounds from natural resources to develop therapeutics and nutraceuticals, attention should be given to create a field for drug trial and pharmacodynamics/ pharmacokinetics studies. Though creation of human resource in the form of health care providers and technocrats is important, yet acute shortage of trained human resource in other biomedical fields and allied sciences have been observed. Expertise in any of the field will create immense opportunity.