

REPORT

Report on the participation of the ICMR International Fellow (ICMR-IF) in Training/Research abroad

1. Name and designation of ICMR-IF : Dr. Manoj Kumar Das
Scientist 'D'
2. Address : National Institute of Malaria Research
IDVC Field unit, ITKI,
T.B. Santorium Complex
Ranchi-835301, Jharkhand.

3. Front line area of research in which training/research was carried out:

Molecular diagnosis of malaria parasites (RealAmp).

Molecular surveillance for anti-malarial drug resistance.

CDC bottle assay for monitoring insecticide resistance.

4. Name and address of Professor and host institute:

Dr. Venkatachalam Udhayakumar.
Chief, Genetics and Immunology Laboratory,
Malaria Branch, Division of Parasitic Diseases and Malaria,
Center for Global Health, Centers for Disease Control and Prevention,
1600 Clifton Road, Bldg 23,
Room 10-167, Mail Stop D-67,
Atlanta, GA 30329
Phone 404-718-4418

5. Duration of fellowship: 6th February, 2013 to 20th February, 2013.

6. Highlights of works conducted:

6.1 Techniques/expertise acquired:

I received training to perform molecular diagnosis of malaria parasites using a novel molecular test developed at CDC. This method is called real-time loop-mediated isothermal amplification (RealAmp). This method is based on isothermal amplification of target DNA which is a different

kind of PCR method. The advantage of this method is that it allows performance of this test in areas where no sophisticated laboratory capacity to perform conventional PCR is available. I learned how to detect malaria parasites using plasmodium genus specific primers and primers specific to *P. falciparum* and *P. vivax*.

I also learned how to conduct molecular surveillance for anti-malarial drug resistance. I learned how genetic targets are genotyped. Since in vivo clinical trials are expensive and time consuming molecular surveillance can be used for predicting emerging trends in the evolution of drug resistance. This will serve as early warning signals for planning in vivo clinical trials when the frequencies of drug resistant parasites increase in frequency.

CDC has developed a new method using insecticide coated glass bottles to rapidly screen insecticide resistance. This method is called CDC bottle assay and many countries are using this method for monitoring insecticide resistance. This method is proposed to be better than the currently used WHO filter paper method for screening insecticide resistance. I learned this method from the laboratory of Dr. Brogden in the CDC Entomology group. CDC will provide any technical support needed to implement these techniques I have learned.

6. 2 Research results, including any papers, prepared submitted for publication: None.
This is very short term training and did not involve any independent projects.

6. 3 Proposed utilization of the experience in India:

I plan to evaluate the use of RealAmp molecular tools for the malaria diagnosis in India. If this technique is validated in India it will be very useful to accurately diagnose malaria species and this will also be a valuable tool in the elimination settings. I will use molecular surveillance tools for drug resistance to monitor evolving patterns of resistance. CDC bottle assay will be evaluated in my projects to study insecticide resistance and compared with WHO method. If this method is better than WHO method then we can adopt CDC bottle assay for monitoring insecticide resistance in India.



Signature of ICMR-IF



Report of Host Institute in connection with the training of Dr. Manoj Kumar Das at CDC

1. Name of Professor (under whom training was carried out):

Dr. Venkatachalam Udhayakumar
Chief, Genetics and Immunology Laboratory
Malaria Branch

2. Name address of host institute:

Malaria Branch, Division of Parasitic Diseases and Malaria
Center for Global Health, Centers for Disease Control and Prevention
1600 Clifton Road, Bldg 23, Room 10-167, Mail Stop D-67, Atlanta, GA 30329
Phone 404-718-4418

3. Duration of fellowship:

February 6th to 20th, 2013

4. Brief highlights of the achievements:

Dr. Das received training to perform molecular detection of malaria parasites using a point of care molecular method called real-time loop-mediated isothermal amplification (RealAmp). This method will allow molecular detection of malaria parasites even in resource limited settings where sophisticated laboratory facilities are not available. CDC will further help Dr. Das for establishing this technology for use in India. The concepts of molecular surveillance and molecular methods for characterizing drug resistant mutations were demonstrated. He was also trained in CDC bottle assay for monitoring insecticide resistance in malaria vector populations. CDC will supply some test samples for Dr. Das to establish this technology in India for rapid screening of insecticide resistant vectors. Dr. Das also gave a seminar about historical accounts of malaria in Andaman and Nicobar Islands. He also met with other eminent scientists at CDC such as Dr. William Collins and Dr. John Barnwell and discussed with them how to study zoonotic malaria in the Indian context as they are the leading experts in this field. He also met with Dr. William Brogden, an eminent entomologist with extensive experience in malaria control, to learn CDC bottle assay for insecticide resistance monitoring.



5. Your assessment of the ICMR-IF

Dr. Das is a highly motivated and dedicated scientist who is eager to address health challenges faced by Indian communities using cutting edge scientific tools. He was very sincere in learning the methods we demonstrated. Dr. Das is eager to establish the techniques he learned at CDC for malaria control in India. Dr. Das gave an impressive seminar about malaria in Andaman and Nicobar Islands where he has spent about 18 years addressing malaria problem. Dr. Das demonstrated his broad experience and dedication to malaria control and prevention in India during various discussions. Our CDC colleagues were highly impressed with the accomplishments of Dr. Das in this field.

6. Any other comments:

Dr. Das wants to translate his experience in CDC to advance malaria control programs in India. He is interested in establishing RealAmp method, molecular methods for drug resistance monitoring and CDC bottle assay for monitoring insecticide resistance. We will be pleased to offer further support in establishing these methods in his laboratory in the National Institute of Malaria Research Field Unit in Ranchi. We look forward to further interact with Dr. Das in supporting exchange of technologies in support of malaria control and elimination programs in India.

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A handwritten signature in black ink, appearing to read "V. Udhayakumar".

Venkatachalam Udhayakumar, Ph.D
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