

REPORT

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

1. Name and Designation of the ICMR-IF : Dr Sugandhi Pangal Rao
2. Address : Department of Microbiology
Kasturba Medical College, Madhav Nagar
Manipal University, Manipal-576104
Karnataka, India
3. Frontline area of research in which
Training/research was carried out : Molecular genetics and gene modulation
In MRSA. Development of newer modes of treatment of MRSA infections.
4. Name and address of Professor
And Host Institute : Prof. Bellur S Prabhakar
Prof & Head, Dept of Microbiology
& Immunology College of Medicine
University of Illinois at Chicago
E-705 Medical Science Building
835 South Walcott Avenue
Chicago, Illinois 60612-7344
5. Duration of fellowship : 15 days (09.02.2013-24.02.2013)

6. Highlights of the work conducted i. Technique/expertise acquired:

Techniques pertaining to molecular genetics and modern biochemical techniques in drug resistant Staphylococcus aureus. She could pursue it in our laboratory by learning to extract, count and stain the CD4 cells using flow cytometry. Further she could harvest the T cell receptor proteins and TNF α in the supernatant released by T cells using spectrophotometer to treat MRSA infections. The cells are used for DNA and 23S mRNA extraction to detect G2576 T linezolid resistant mutation. This will target the toxins unlike drugs. These techniques can help to learn gene modulation in resistant bacteria in the presence of vitamins and trace metals. In clinical service department she had the opportunity geneteck to detect resistant genes in MRSA, group B Streptococci from nasal and endo cervical swabs. She had the opportunity to meet the global Health department had fruitful discussion on problems of MRSA world wide and the possible solutions.

:

- ii) Research results, including any papers : yet to be done
Prepared/submitted for publications
- iii) Proposed utilization of the experience
In India : Kasturba medical college being one
of the premier institute, has been identified for project by ICMR on establishing a net

work on surveillance of antimicrobial resistance on various organisms, MRSA being one of them. Dr Sugandhi Rao has been identified as PI for this MRSA project. MRSA has spread globally and there is a threat of infections in hospital and community settings causing considerable mortality and morbidity. Hence it is imperative to undertake in-depth study and analyze this bug to molecular and sequencing level. Hence her visit and work done will be applied directly for this project. Further resistant gene modulation in presence of trace metals would help in developing new modes of treatment in the patients with MRSA infections. Future project will aim at molecular characterization of hospital and community MRSA for SCCmec types and various virulence genes for toxins such as Panton-Valentine Leucocidin and their correlation with different clinical spectrum. The data generated by this study can be utilized to plan hospital antibiotic policy, an essential step in the containment of antibiotic resistance which has emerged as a global threat. Further, the clinico-epidemiological mapping by DNA sequencing would provide valuable information on acquisition and transmission dynamics of MRSA. Antimicrobial susceptibility tests and documentation of patient risk factors, SCCmec characterization by multiplex PCR assays, and characterization of antibiotic resistance genes and virulence genes which will help in detection of new clones in future. In future project will also aim at genotyping for virulent genes of toxic shock toxin (tst) and enterotoxin (sea) of *Staphylococcus aureus* using following primers FCAGTAAATGTGTCAAAGA R-TTGACTACCAGCTATATC, F- GGATATTGTTGATAAATATAAAGGGAAAAAG R-GTTAATCGTTTTATTATCTCTATATATTCTTAATAGT respectively as part of ICMR project. The results of the work done in foreign institute will be utilized for molecular typing and to plan hospital antibiotic policy to curb antibiotic resistance and to reduce hospital/ community MRSA infections.

ICMR Sanction No. : No.INDO/FRC/452(S-01)/2012-13-IHD

Date : 08/03/2013

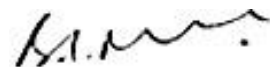
Dr Sugandhi Pangal Rao
Professor of Microbiology
KMC Manipal, MU

UNIVERSITY OF ILLINOIS
AT CHICAGO

College of Medicine
Department of Microbiology and Immunology (MC 790)
E-704 Medical Sciences Building
835 South Wolcott Avenue
Chicago, Illinois 60612-7344

REPORT OF HOST INSTITUTE

1. Name of Professor: Dr. Bellur S Prabhakar,
(under whom training was carried out) Professor and Head
2. Name and address of the host institute: Dept of Microbiology and Immunology
College of Medicine, University of Illinois at
Chicago
E-705 Medical Science Building
835 South Wolcott Avenue
Chicago, Illinois 60612-7344
3. Duration of the fellowship: 15 days (09.02.2013-24.02.2013)
4. **Brief highlights of the achievement:** Dr. S. Rao had a special interest to learn the techniques pertaining to molecular genetics and modern biochemical approaches to identify drug resistant Staphylococcus aureus. She could pursue it in our laboratory by learning to extract, count and stain the CD4+ T cells using flow cytometry. Further she could harvest, and measure various cytokines including TNF- α in the supernatant released by T cells using a number of different approaches to treat MRSA infections. This will target the toxins unlike drugs. The bacterial cells were also used for DNA and 23S mRNA extraction to detect G2576 T linezolid resistant mutation. These techniques can help to learn about gene modulation in resistant bacteria in the presence of vitamins and trace metals. In the clinical service department she had the opportunity to use geneteck to detect resistant genes in MRSA, group B Streptococci from nasal and endo-cervical swabs. She had the opportunity to meet the global Health department and had fruitful discussions on problems of MRSA world wide and the possible solutions.
5. Your Assessment of the ICMR- IF: We enjoyed hosting Dr. Rao. She is a highly experienced clinician microbiologist and has a great desire to improve identification of various microbial agents using current technology with the eventual goal of developing newer modalities of treatment.
6. Any other comments: Dr. Rao interacted extensively with clinical microbiology faculty in the department of Pathology and researchers in the department of microbiology and immunology. She had fruitful discussions with the global health institute.



Bellur S Prabhakar, Ph.D.
Professor and Head
Department of Microbiology and Immunology
College of Medicine