ICMR International Travel Support for Non-ICMR Scientist

No. 3/2/TG-54(42)/HRD-2014

- ❖ **Name & Designation** : **Ms. Devapriya Sinha, Research Scholar.**
- ❖ **Address** : **Dept. of Chemistry, University of Delhi, Delhi-110007.**
- ❖ **Name of the International Conference/ Seminar/Symposium/ Workshop** : **International Conference Antimicrobial Research-2014.**
- ❖ **Title of the abstract accepted** : **Novel Bis-benzimidazole exhibits selective inhibition of E. coli topoisomerase IA through mental chelation based mechanism: A way to overcome multiresistant strains.**
- ❖ **Date & Venue** : **1-3rd October 2014, Madrid, Spain.**
- ❖ **Money sanctioned** : **Rs 1,00,000/-**
- ❖ **Money reimbursed** : **Rs 32,058/-**

Participation Report

The III International Conference on Antimicrobial Research brought together more than 444 scientists from 58 countries across the world to talk about antimicrobial research. "Anti" is here taken in the broadest sense as covering the topics on antimicrobial resistance, (early) microbial and resistance detection, enhancement of innate defences against pathogens, as well as new methods and techniques for rapid microbial and resistance detection. This third edition of the ICAR conference gathered around 450 participants, coming from more than 60 countries. And more than 440 works were presented at the conference. More than 313 posters were presented covering the different topics with 11 virtual presentations flashed online platform on the conference website. During the conference closure function, some of the delegates gave their impressions about the event and expressed satisfaction over the high quality of technical discussions and overall arrangements.

7. Academic Highlights of the training/ workshops, including major recommendation and the following. (in 200 words)

(i) New development presented in the training/workshop:

(ii) New development resulting from the training / workshops

(iii) Name of publication in case your work is recommended for publications.

Each day in the conference, we had a key note lecture. Prof. Ali Karami a scientist at Research Center of Molecular Biology, Baqiyatallah University of Medical Sciences, Iran, presented the first key note lecture. In his talk he introduced the latest development in the field of simple, rapid and ultra-rapid detection and identification methods for microbial photogenes and rapid method for detection of anti-microbial resistance in the world of

infectious diseases. The second day keynote lecture was presented by Dr Yves Briers from University of Leuven, Belgium. He introduced Artilysins an enzyme produced by bacteriophages at end of lytic replication cycle which are highly bactericidal.Artilysins, irrespective the presence of drug resistance mechanisms, show a low probability of resistance development, and have unprecedented bactericidal activity. Dr Goutam Gupta a scientist at Los Alamos National Laboratory, in the United States, gave the key note lecture on the third day of the conference. His talk summarized the results obtained in a multi-disciplinary project on the nature of the individual processes and their coupling. He concluded that not only do the Pseudomonas efflux pumps confer additional drug resistance via biofilm formation but also they lead to resistance against host innate immune response. Other than this, the conference included a wide range of talks from scientists and research scholars from many scientific disciplines which was divided into different sessions as mentioned 1. Clinical and medical microbiology, infectious diseases and antimicrobials: Public Health 2. Biofilms: formation, control and eradication 3. Bacteriophages: Phage therapy 4. Antimicrobial materials science and surface chemistry: Antimicrobials in consumer product 5. Techniques and Methods: rapid detection of microbial and resistance 6 Antimicrobial physics for exploitation of physical properties for killing/inactivating microbes 7 Antimicrobial chemistry for Synthesis and screening of novel chemical compounds for antimicrobial action 8 Antimicrobial natural products. I: Peptides 9. Antimicrobial natural products II: Terrestrial and marine organisms. 10. Biocontrol of microbial synthesized toxins 11 Antimicrobial resistance - Mechanisms of action of antimicrobial agents and 12. Attenuation of virulence by interfering microbe-microbe communication. The proceedings of the meeting will be formally released as a book titled "Multidisciplinary approach for studying and combating microbial pathogens". The book will be published by BrownWalker Press.

Participant's contribution to the training/ workshops (100 words)

In III International Conference on Antimicrobial Research, I delivered an oral presentation on a part of my Ph.D. work entitled "Novel bis-benzimidazole exhibits selective inhibition of E. coli topoisomerase IA through metal chelation based mechanism: A way to overcome multi-resistant strains" in the session of Antimicrobial resistance - Mechanisms of action of antimicrobial agents. In my talk, I shared my finding on bisbenizimidazole acting as novel DNA topoisomerases IA inhibitor. In my presentation I focused on Topoisomerase IA which is believed to be a novel target for multi resistant strains but is the less explored as drug target. In this event, I have demonstrated PPEF a bisbenzimidazole had most significant inhibitory effect against *E. coli* topoisomerase IA among the series of compounds, with IC_{50} = 2± 0.05 μM and also with lowest MIC against most of the clinical, pathogenic, and resistant *E. coli* strains among the 24 compounds evaluated. I have also presented the mechanism of inhibition, showing these compounds act as poison inhibitor and Mg^{2+} chelation as a probable mechanism of inhibition. Results of docking and modelling studies were also presented to support the presumption of metal chelation based inhibition. *In vivo* mouse systemic infection and neutropenic thigh model experimental results were presented to demonstrate the confirmed therapeutic efficacy of PPEF. As per contribution aspects our study illuminates new properties of bis-benzimidazole to develop it as an efficient anti-bacterial agent targeting topoisomerase IA and giving us a hope that this mechanistic based development of new chemical entities as drug may overcome antibiotic resistance.