

Preface

This NATO-ASI (Advanced Study Institute) entitled Detection of Chemical, Biological, Radiological and Nuclear Agents for the Prevention of Terrorism was held successfully at the Certosa di Pontignano – Università degli Studi di Siena, Castelnuovo Berardenga (SI), Italy, from May 25 to June 2, 2013. It was a great success from both scientific and organizational points of view.

We were extremely lucky to have an excellent organizing committee which facilitated all the tasks associated with this NATO-ASI. The excellent efforts of Professors Richard Caprioli (Vanderbilt University), Gianluca Giorgi (University of Siena) and Mokhtar El Essassi (Mohammed V University, Agdal) are sincerely acknowledged.

We are indebted to Professor Caprioli who was instrumental in inviting the best CBRN lecturers and industrial partners and, in addition, let us avail of Ms. Maureen Casey, Managing Editor of the *Journal of Mass Spectrometry*, for all the organizational work.

We were privileged and honoured to have as lecturers for this NATO-ASI a succession of world-renowned scientists, namely Professor Richard Caprioli; Stanley Cohen, Professor of Biochemistry, Director of the Mass Spectrometry Research Center, VICC Member and Chief Editor of the *Journal of Mass Spectrometry*, from Vanderbilt University; Professor Alvin Fox, Department of Pathology, Microbiology and Immunology, USC School of Medicine, Columbia, USA, who is also Editor in Chief of the *Journal of Microbiological Methods* and joint Editor in Chief of *Molecular and Cellular Probes*; Professor Guenter Allmaier, Institute of Chemical Technologies and Analysis, Vienna University of Technology; Professor Mark Duncan of the School of Medicine, University of Colorado, USA; Professor Gianluca Giorgi, University of Sienna; Professor Giovanni Sindona, University of Calabria; Dr. Steve Lammert, Torion Technologies Development, Utah, USA; and Dr. Oliver Terzic from the Organization for the Prohibition of Chemical Weapons, to present a series of lectures on CBRN agents detection.

The main objective of this NATO-ASI was to provide the attendees with the latest developments necessary to successfully understand the CBRN agents and their associated biotechnologies. Furthermore, this NATO Advanced Study Institute was designed to provide advanced training for doctoral and postdoctoral candidates in state-of-the-art technologies for bio-detection, and the meeting's primary focus was on mass spectrometry (including chromatographic and electrophoretic separation) and comparisons of spectroscopic, immunological and molecular analyses of chemical, biological, radiological and nuclear agents.

The NATO-ASI participants were taught how CBRN agents are easy to manufacture, conceal and release. This lack of watchfulness makes prediction of biological and chemical bioterrorism threats very difficult. Notwithstanding that the ability to rapidly detect, identify and monitor CBRN agents is imperative for the efficient use of both military and civilian defence resources. This detection knowledge allows the severity and extent of a hazard to be assessed so that areas which are clean and/or contaminated.

Additionally, the NATO-ASI participants were also introduced to the rapid developments in biotechnology, genomics and xenobiotics which could be used as CBRN agents and hence have severe implications for international peace and security.

Topics on the fields of microbiology, immunosensors and immunology of lethal bacteria, viruses, fungi, prions and spores were discussed. Special emphasis was placed on Gram-positive *Bacillus anthracis*, smallpox and polio viruses, SARS, Ebola and Marburg viruses, novel flu viruses, etc.

The relaxed atmosphere of this venue stimulated discussions between faculty and trainees concerning additional details of the lecture subjects and advanced protocols and technologies.

The main scientific consensus proposed by our NATO-ASI participants was as follows: While there is no single detection method that provides rapid and accurate detection of CBRN agents, the onus is on NATO countries to keep abreast of the powerful, new state-of-the-art detection technologies that can help protect the public from emerging food and environmental chemical/biological threats. There is a need to make sure that all NATO countries use the same protocols and identical instrumentation for the detection of CBRN agents.

Finally, this NATO-ASI has contributed to the critical assessment of existing knowledge on new and important detection technologies. It helped to identify directions for future research and to promote closer working relationships between scientists from different professional fields. In addition, it facilitated employment for postgraduate participants from different countries.

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