BIOSAFETY AND BIOSECURITY - MEDICAL COUNTERMEASURES AGAINST BIOLOGICAL AGENTS AND WEAPONS - A TWO DAYS MEETING IN TIMISOARA

Dana S. Brehar-Cioflec

INTRODUCTION.
GENERAL BACKGROUND

Biosafety in medical laboratories has been a constant concern for specialists worldwide and it materialized in various publications starting with the 1993 World Health Organization (WHO) first edition of the laboratory biosafety manual. This was the starting point of a continuous effort for the acceptance and implementation of basic elements and notions regarding biological safety. It led to the elaboration of national codes of laboratory practice for the safe manipulation and processing of pathogenic microorganisms and for potentially contaminated biological products.

Given the extraordinary dynamics of scientific research in the field of microbiology, the last two decades have been marked by a continuous expansion of the list of identified and characterized microorganisms. Microbial taxonomy has been constantly readjusted in parallel with the development of microbiological techniques and equipments. New clinical entities have been discovered and described as "emergent infectious diseases". Also, the epidemic dimension and clinical evolution of some infectious diseases have been marked by important changes as compared to previously known data; this has led to these diseases being labelled as "re-emergent infectious diseases". Moreover, together with newly discovered microorganisms (highly infective and extremely virulent), the phenomenon of increased antibiotic resistance of previously sensitive microbial strains is generating serious problems all over the world.

Consequently, biosafety rules, guidance and recommendations have been readjusted and completed as well. Due to technological advances, this period has also been characterized by important progress in the field of human and environmental protection against biological agents. This is the result of the continuous need for protecting the laboratory staff, as well as the...
community, against accidental release of hazardous biological agents into the environment.8

During the last decades, another aspect has emerged, namely the intentional use and spread of biological agents i.e. bioterrorism. This also refers to “deliberately modified microorganisms” (i.e. artificially increased infectivity, virulence, antibiotic resistance, etc.).8

THE IDEA OF A PROJECT IS BORN

Laboratory specialists in Romania have been involved in many projects aiming at harmonizing laboratory medicine to European and WHO recommendations. Efforts were made in order to improve microbiological safety for laboratory staff and for the environment. Designing and implementing quality systems in an increasing number of laboratories has also emphasized biosafety and biosecurity recommendations.

Given the above, the idea of organizing a meeting between specialists active in the field of public health microbiology, epidemiology and connected areas appeared not only appropriate but also necessary. Discussions between the promoters of the idea (i.e. the two co-directors and the members of the organizing committee) led to formulation of the main objectives such a meeting should try to achieve. We all agreed that the NATO „Science for Peace” Programme could be a suitable framework, so a project proposal was elaborated and submitted with the purpose of organizing a NATO funded advanced research workshop in Timişoara, Romania.

The proposed workshop was intended as a debate on the latest developments in the field of biological hazards and potential public health threats generated by bioterrorism. The location of the workshop was motivated by the progress achieved in the area during the last decade. As previously shown, Romania has been supported by various international programmes on its way towards European and Euro-Atlantic integration. The workshop could be seen as a part of the joint efforts made to harmonize Central and Eastern European systems to international standards and regulations. We chose to organize this workshop in Romania, a relatively new NATO member and a fresh member of the European Union.

The choice of the topic and location were motivated by the fact that biosafety and biosecurity have been constant priorities for the Institute of Public Health in Timisoara. Previously, these had been addressed during the PHARE Project RO 010714.01 “Technical Assistance for Improving the Romanian System of Epidemiological Surveillance and Control of Communicable Diseases” - Team Leader: Dr. Robert H. Stevens. The author of the present brief communication has been involved in the above mentioned project, especially in activities aiming at harmonizing laboratory medicine to European and WHO recommendations, including design and implementation of quality systems in public health laboratories.

Keeping in touch via E-mails, the two Co-Directors agreed on the main objectives of the proposed Advanced Research Workshop (ARW) and formulated a plan of action. The application form was submitted for the 1st of November 2006 deadline.

GATHERING THE TEAM OF SPECIALISTS

During the second half of 2006, contacts were made (mainly by email) with specialists potentially interested in joining the project either as “key speakers” or as “participants”. First contacts were made with previously known colleagues (i.e. microbiologists, epidemiologists, public health specialists and other professionals) with whom the two co-directors had been engaged in various projects. They were approached with proposals to participate and were sent a brief material containing the justification of the project and the expected outcomes. They were also asked to present the project to other colleagues whom they thought might be interested and/or suited to participate.

The European Biosafety Association (EBSA) was contacted and asked for advice and support. At the same time, the Tentative Programme was being drafted. A list of topics/lecture titles was formulated and sent to all the specialists who had expressed interest in the planned meeting. As the list of subjects was open, it was refined and expanded by those who decided to participate as “key speakers”. All changes and improvements of the scientific programme were the result of constant e-mail exchange and discussions between the future participants. The whole process of designing the programme was characterized by transparency and effective communication.

The invited speakers were international experts who could share knowledge on biosafety and biosecurity. Their expertise includes organizing national systems for laboratory surveillance of infectious diseases, as well as academic experience. Some of the participants have also been actively involved in EC funded
programmes with specific objectives on improving the capacity of Romanian laboratories in the infectious diseases national surveillance system. Implementation of biosafety and biosecurity rules has been one of the main targets. For this, the National Biosafety Guide for Medical Laboratories for Romania has been elaborated with the financial and technical support of the European Union (PHARE projects RO 0107.14 and RO-2002/000-586.04.1101)\textsuperscript{9}

The Institute of Public Health Timișoara was invited to support the meeting as co-organizer. In this quality, the institute offered to host the scientific activities of the workshop i.e. the two working days of lectures and work groups. The Institute also officially supported the application made by the Co-Directors to the Romanian Board of Physicians who credited the meeting with 12 CME (continuous medical education) points.

**THE MEETING**

Each day included lectures given by the “key speakers” and work groups. The meeting was highly interactive. Discussions which followed the presented lectures, work groups and the plenary sessions which ended each of the two days, proved to be excellent occasions for the participants to share expertise, problems, questions and to formulate preliminary statements on the discussed subjects.

![Figure 1.](image)

Figure 1. The mesh of the NATO ARW "Biosafety & Biosecurity - Medical Countermeasures against Biological Agents and Weapons" - 39 participants from 16 countries.

Discussions focused on the following main directions:

- National and international guidance and recommendations in the field of biosafety and biosecurity in biomedical laboratories and production facilities;
- The best and most feasible ways of organizing, monitoring the dynamics of microorganisms and designing and implementing biosafety and biosecurity guidance on national laboratory systems in order to minimize intentional and /or accidental release of biological agents from biomedical laboratories;
- Surveillance systems for early detection and control of outbreaks caused by accidental or deliberate release of infectious agents i.e. design and implementation of sentinel systems; differentiating natural occurrence of infectious disease clusters from bioterrorist attacks;
- Risk assessment methodologies for biomedical laboratories and production facilities processing biological agents and/or potentially contaminated biological products;
- Design and implementation of rapid response procedures in cases of deliberate/accidental release of highly infective biological agents;
- Transport of biological products and potentially biohazardous material;
- Keeping the balance between biosecurity requirements and freedom of scientific activities; beneficial handling and use of hazardous microorganisms versus potential biothreats;
- Methodologies for educating and training medical professionals for emergency preparedness in cases of bioterrorism, including team building, multidisciplinary approach, informing the general public, i.e. acting according to previously designed and implemented standard operating procedures (SOPs);
- Designing and exercising potential bioterrorist emergency scenarios.

![Figure 2.](image)

Figure 2. Dr. Robert H. Stevens presents a communication on “Design and Implementation of Surveillance Systems for the Early Detection of Infectious Disease Outbreaks Caused by Accidental/Deliberate Release of Pathogens: Models of Sentinel Systems”.

**FUTURE PLANS AND PROJECTS**

All the 39 participants coming from 16 European countries agreed that the NATO ARW on the 8th and 9th of November 2007 should represent a “start-up”
meeting with the purpose of organizing an informal network of professionals who will continue to cooperate and share expertise on biosafety and biosecurity issues. (Figs. 1-3) Moreover, the participants decided to try and repeat such meetings and to collaborate for organizing biosafety trainings.

The main objectives which were agreed upon were: the need of establishing scientific collaborations on high threat pathogens, in the area of diagnostic developments, agent and reagent exchange, antimicrobial agents, quality systems, agent’s collections and characterization, disease surveillance from a laboratory perspective and biosafety training; the necessity to widen and aid the setting up of training programmes for healthcare workers in the fields of microbiology, biosafety, internal and external quality assessment; the need to promote and establish links between European and WHO microbiological and biosafety networks in order to implement and support operational ‘best practice’.

At the end of the meeting, each participant was asked to fill in an Evaluation Form. The analysis of these Evaluations will be performed by the Co-Directors and the results will be shared with all participants. The exchange of ideas will continue and future projects will be designed. This ad hoc network of specialists could join efforts in obtaining human and financial resources for organizing similar events in the near future (e.g. laboratory based “Train the trainer” type of courses).

REFERENCES