

RENEB – THE ROMANIAN PERSPECTIVE

M. A. Cucu^{1,*} and I. A. Popescu²

¹UMF Carol Davila Bucharest, Dr Leonte str. 1-3, 050463 Bucharest, Romania

²National Institute of Public Health, Regional Center of Public Health Iasi

*Corresponding author: alexandra.cucu@insp.gov.ro

The European Commission supports the development of an European network in biosimetry (RENEB), in which a large number of experienced laboratories from 16 European countries are involved. The final goal will be the significant improvement of the biosimetry capacity for response to accidents and radiological emergencies, based on a well-organized cooperative action with a rapid and rigorous dose assessment. The project is aimed at consolidating the network with its operational platform, inter-comparison exercises, training activities, proceedings in quality assurance and implementation and integration of new network partners and new methods. In the project context, the Romanian perspective on the participation benefits for the Romanian biosimetry is described.

INTRODUCTION

Radiological hazards are constantly occupying one of the first places in population risk perception hierarchy. Even rare nuclear and radiological emergencies, as the recent event in Fukushima proves, might occur. In this context, the public health responsibility for preparedness includes development of a sustainable, sensitive, timely, accurate and well trained network of laboratories capable of performing biological dosimetry as an effective instrument for screening and of exposed individuals and providing guidance for treatment⁽¹⁾. As a response, the European Commission's RENEB project (Realizing the European Network of Biosimetry), that started in January 2012, funded by the seventh Framework Programme, grant agreement no. 295513, bringing together 23 laboratories from 16 EU countries and offers the possibility to update, compare and improve national capabilities on biological dosimetry methods⁽²⁾.

ROMANIAN RADIOLOGICAL PROTECTION CONTEXT

Romania, an European Union member state since 2007 has a large territory, administratively divided in 42 districts and a population of ~20 million inhabitants. Owner of a nuclear power plant, situated in vicinity of other neighboring plants and not so far from the Chernobyl, the country has a rather strong and active system for radiological hazards regulation, surveillance and control, compliant with European Union's requirements and in line with IAEA standards.

Complex, sensitive and object of multidisciplinary approach, the radioactivity issues are coordinated at the national level by an independent regulatory body, the National Commissions for Nuclear activities control, (Comisia Națională pentru Controlul

Activităților Nucleare), which collaborates with several governmental institution responsible for health, environment or emergency response for carrying out all the system activities. The ministry of health is a traditional partner in radiation surveillance and control of ionizing activities being responsible for two strains of activities: public health, preventive activities and medical assistance and medical treatment centered activities. The public health responsibilities include: authorization of all nuclear activities, food irradiated products surveillance, premarket authorization of products intended for human use containing radioactive substances, the surveillance and control system for drinking water and food, and also to medical and occupational exposures as well as public health preparedness and response in emergencies.

For public health issues a network of public health laboratories was created in 1957. Technical coordination of this network is ensured by the National Institute of Public Health (NIPH), a technical body, subordinated to the Ministry of Health that builds on the structure of four former health institutes.

The Institute's main activities are: prevention, surveillance and control of communicable and non-communicable diseases; health monitoring; health promotion and health education; occupational health assessment; monitoring in relation to environmental health; develop public health regulations; ensuring public health management and development of specific public health services. Corresponding to those roles the Institute activities are coordinated by four National Centers responsible for:

- Surveillance and Control of Communicable Diseases (CNSCBT).
- Environmental Monitoring of Risks in the Community (CNMRMC).

- National Center for Evaluation and Promotion of Health Status (CNEPSS).
- National Center for Public Health Statistics Monitoring (CNMSP).

Six other regional centers, that concentrate lab capacities, are located in Bucharest, Cluj, Iasi, Timisoara, Targu Mures and Sibiu and are responsible for coordination of implementation of activities. Among these only four include an ionizing radiation laboratory in their structure: Bucharest, Cluj, Iasi, Timisoara.

Local implementation is carried out by 18 Radiation laboratories included in the structure of territorial governmental body, the Public Health Directorate. They carry out their specific activities for more than one county, in order to cover all the 42 districts.

The legal framework for activities carried out in this field is represented by the Ministry of Health programme for Environment and Health. The main activities implemented focus on protection of health and prevention of illness due to ionizing radiation exposure, from natural, medical and occupational sources. Both at the national and local level, activities are performed by multidisciplinary teams composed of medical doctors, biologists, medical physicists and radio chemists.

BIODOSIMETRY STATUS

As part of public health responsibilities in emergency preparedness biodosimetry capacities were developed in Bucharest, Timisoara and Iasi based on research projects and bilateral collaboration within country and outside the country laboratories. Cytogenetic laboratories have over 25 years' experience in cytogenetic assays, including studies of genetic effects (micronuclei in peripheral lymphocytes-MN, chromosome aberrations-CA, dicentric-DC) in occupational exposure to different toxicants (pesticides, heavy metals with carcinogenic risk, asbestos, organic solvents) and in the last 11 years, the biological dosimetry for occupational ionizing radiation exposure. The MN tests are performed by specialized personnel (physician and biologist with PhD degree).

The Bucharest Laboratory obtained national accreditation for biodosimetry in 2007 as a certification of its proficiency. Also, the Bucharest Regional Center performs individual dosimetric surveillance for about one-fourth of all exposed workers in country, and in collaboration with the biodosimetry specialists, they work on dose reconstruction in very rare overexposures identified by personal dosimetry.

According to the new regulation for occupational exposure surveillance, cytogenetic assays have been mentioned as periodical check test since 2004. Still the implementation lies on the judgment of the

occupational medicine specialist who could recommend biodosimetry tests 'by case' for all cases of the occupational exposures to radiation. That leads to a constant exercise of biodosimetry assays in the mentioned laboratories, mainly on a contractual basis.

During the last few years, in line with national efforts to reduce budgetary costs due to economic crisis, all public health laboratories, national and local were affected by the cost cuts. Consequently, the number of specialists in the system was reduced (by retirements and posts blocking) in addition to reduced funds for current activities and training.

ROMANIAN CONTRIBUTION IN RENEB PROJECT

One of the goals of European Commission's activities on rapid medical response to radiological accidents or malevolent attacks (triage of patients according to the degree of their exposure to ionizing radiation which can cause acute health effects) is to create the European network of biological and retrospective dosimetry (RENEB); biodosimetry being recognized as a sensible and important emergency response strategy. The project represents the basis for the implementation of the following five strategic objectives^(2, 3):

- (1) *Operational basis*: to create a 'stand-by' centre, based on coordination of the existing reliable and proven methods in biodosimetry.
- (2) *Basis for development*: to expand and improve the network implementing appropriate new molecular biology methods and integrating new partners.
- (3) *Basis for Quality, Education and Training*: to assure high quality standards by education and training activities of members and interested non-members, with special focus on quality assurance and management regarding the performed assays and involved laboratories.
- (4) *Sustainability*: to establish a legal framework, harmonize the network infrastructure and providing links to emergency preparedness and research platforms.
- (5) *Dissemination*: to guarantee dissemination of knowledge by providing access to internal and external communication platforms and databases and close cooperation with national and global emergency preparedness systems and organizations (REMPAN, RANET)^(4, 5).

The established network is designed to be an active consortium. Its sustainability depends on openness and the ability to react in a flexible way towards new situations, based on the awareness of new technological developments as well as gaining of network members. Thus, it is a major goal of the RENEB consortium to actively identify potential new

partners. NIPH is coordinating the task for identifying and integrating new partners (task 2.2 WP2). The first step of the procedure will be to recognize and integrate new partners into the established network, by identification and recruitment based on the formal criteria for their membership.

A four point identification strategy was developed to identify and recruit new candidate partners:

- Information dissemination through presentation of RENEB projects at scientific meetings (posters, talks, on-site web dissemination).
- Establish formal criteria for membership admittance with consortium approval regarding technical status, biodosimetric methods used, processing capacity, quality assurance and quality control procedures other international collaboration in biodosimetry assay and staff (existing biodosimetry specialized personnel, training intention in new methods for future appliance).
- Active identification by asking for the cooperation of the institutes, organizations and agencies having activities related to biological dosimetry, which expresses their interest in a long-term commitment to an European biodosimetry network (e.g. sending a letter to national health authorities from EU countries).
- Assessment—integration strategy for new partners by validation of new lab members, participation in inter-comparison exercises, staff training maintenance.

Participation and collaboration with other work package

NIPH participated in both inter-comparisons for micronuclei and dicentric assays (2013, 2014) in WP1 (work package, WP) organization and collaborated with WP3 (Education, Training and Quality) and WP4 (communication) activities.

Importance of RENEB project for Romanian public health radiation network

Participating in a coordinated international network, established by the project consortium, represents an important achievement with benefits, both on short-term and long-term, for the NIPH laboratories and for the national public health preparedness. So, performing assays, exchanging information in the international network of laboratories performing biological dosimetry

at the European level is the first visible benefit. Also, participating in international inter-comparisons, so rare for that specific assays, is in the same time an opportunity and a challenge for our specialist to reconfirm and compare their methods and capabilities.

In the long-term, it is an opportunity to recall the quality management procedures, methods and to be closer to the best possible answer from the methodological point of view. For the management and financial team, it was an opportunity to understand and apply the financial rules newly set up for these types of projects. It was also a way to exchange information on specificities and limits of methods and also to perform assays according to the newest, standardized procedures.

From a long-term view, at a strategic level, being part of the international network of laboratories performing biological dosimetry at the European level is the most important goal achieved at the end of the project. In this way our preparedness, part of the public health mission, is closer to requirements.

The training sessions prepared in accordance with identified training needs organized during project activities represents another important gain that otherwise would not exist and influence lab capabilities on long-term run.

By the collaboration established in the consortium between governmental bodies, like our organization, research and academia representatives we gain knowledge, experience, contacts and friendship, we became closer to the newest achievements of research in radiobiology.

REFERENCES

1. Wojcik, A., Lloyd, D., Romm, H. and Roy, L. *Biological dosimetry for triage of casualties in a large-scale radiological emergency: capacity of the EU member states*. Radiat. Prot. Dosimetry **138**, 397–401 (2010).
2. Kulka, U. *et al. Realizing the European Network of Biodosimetry (RENEB)*. Radiat. Prot. Dosimetry **151** (4), 621–625 (2012).
3. Voisin, P. *et al. RENEB – Realizing the European Network in Biological Dosimetry*. Radiat. Prot. Dosimetry 19.1–19.10 (2012)STO-MP-HFM-223.
4. Carr, Z. *WHO-REMPAN for global health security and strengthening preparedness and response to radiation emergencies*. Health Phys. **98**, 773–778 (2010).
5. International Atomic Energy Agency. *Response and Assistance Network*. IAEA (2010)