Slovenia

Report on EMF Activities

10th International Advisory Committee on EMF

June 2005

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1. General research activities in Slovenia related to EMF and health

In 2004, **Laboratory of Biocybernetic at the Faculty of Electrical Engineering**, University of Ljubljana was involved in three international and five national research programs and projects. Within the ESOPE project of the 5th European Framework, the researchers of the laboratory cooperated with four medical and research centers from France, Denmark, Ireland, and Slovenia on the establishment of standard operating procedures for electrochemotherapy (ECT) and electrogenetherapy (EGT). Within a PROTEUS program of the French-Slovenian scientific cooperation, the laboratory continued its collaboration with the Institute Gustave-Roussy in Villejuif, France, and Institute of Oncology in Ljubljana, Slovenia, in evaluation of electrical parameters for effective electrochemotherapy and electrogene therapy, and design of electrochemotherapy in clinics. Cooperation with the researchers from the University of Zagreb, Croatia, focused on evaluation of electrochemotherapy and electrogenetherapy by means of bioimpedance measurements. In the national research programmes and projects, the main directions of investigation are cell membrane electroporation with its applications in ECT and EGT, electrical stimulation of chronic wound healing and non-invasive measurements of tissue perfusion and oxygenation. Many additional details about the members of the group and their work can be found at the web page lbk.fe.uni-lj.si

Department of Experimental Oncology at the **Institute of Oncology in Ljubljana**, is actively involved in research of biological effects electromagnetic fields. Specifically we investigate and develop new treatment approaches for treatment of cancer using high amplitude electric pulses (electroporation). Electroporation can be used *in vitro* or *in vivo* for certain chemotherapeutic drugs that have hampered transport through the cell membrane. By electroporation, transport of the drugs through the cell membrane is facilitated and consequently also their cytotoxicity. However, electroporation can also be used for gene delivery, this is very promising approach of non-viral gene therapy. In the past year nine scientific papers were published in peer-reviewed literature. Many additional details about the members of the group and their work can be found at the web page www.onko-i.si

The general activities are related to EMF measurements in living and working environments including dosimetry. Several research institutions and commercial companies were accreditated by Slovenian Accreditation (www.gov.si/sa).

2. Areas of public concern and national responses

- Within the coordination action – **project FORUM EMS** – many different activities have been organized including publishing comprehensive book on EMF - *Health and Environment*, public hearings, internet page, open telephone, educational workshops, media articles and interviews, etc. Many additional details about the project Forum EMS could be found at the web page www.forum-ems.si).
- Scientific board of the project Forum EMS has responded several time on various controversies in media and participated on several open public hearings and workshops.
- Three network providers, national Telekom and broadcast company (RTV SLO) have signed a code of good practice that follows major risk communication guidelines for better interactions between all stakeholders. It is hoped that open communication and discussion between the owners of the EMF source, local council and the public during the planning stages could help create public understanding and greater acceptance of a new facility.

- In addition to code of good practice, a special model of partnership is being investigated between government, united local communities and network providers.
- Measurements at various sites have shown that in publicly accessible areas exposure limits are never exceeded or even approached. Despite that, an increasing number of people is attributing a variety of complains – headaches, sleeplessness, even general pains to the radiation from the antennas.
- A special study is under preparation by the project Forum EMS where health questionnaires will be distributed to people who are complaining about symptoms of ill health which they ascribed to exposure to electromagnetic fields (EMF). The objective of the survey is to gain a better knowledge of the anxieties of complainants, to obtain hints of possible problems and of actions that should be taken to solve the problems.
- The mobile technologies are still of primary interest of the public and media. Disturbing messages in the media on alleged adverse health effects and lack of information (based on scientific data) of the inhabitants of surrounding areas where antennas are being installed, have lead to an continuously increasing wave of concerns.

3. New policies and legislations regarding EMF exposure

The **Ministry of Environment** is preparing the revision of the *Decree on EMF in living and natural environment* form 1996. The new revision will be harmonized with the Council Recommendation (1999/519/EC of 12 July 1999) on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) and will implement also some precautionary measures. At the same time, the Ministry of Environment is preparing the open database on all EMF sources that are operating in the environment in Slovenia and exceed the certain threshold in terms of radiated power. Such a database will offer a good background for completing the mapping of the field strengths around EMF sources in real 3-D environments.

4. Meetings

The international conference on EMF- From Bioeffects to Legislation was held in Ljubljana, Slovenia in November, 8-9 2004 and organized by the Institute of Non-Ionizing Radiation (www.inis.si) in collaboration with some key international organizations (WHO, ICNIRP) and active European projects (EMF NET, COST 281). The aim of the conference was to provide an answer to our information based society's most commonly asked question: Do current EMF standards provide sufficient protection against EMF exposure? This question is particularly important since some new EU member states and candidate Members of the EU use lower limit values in their standards and legislation in the field of EMF. The Conference provided a unique opportunity to compare and discuss not only different standards but, more important, different approaches to the development of standards and legislation. It is related in particular to the old divergences between "Western" and "Eastern" approaches, and to the possibility of reaching consensus in the future. Such discussion is especially needed for the new EU Countries that have to deal with the EU Recommendation of July 2001 and the EU Directive for protection of the workers of May 2004. The conference conclusions and recommendations could be found at:

http://www.who.int/peh-emf/meetings/bioeffects_slovenia04/en/index.html

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