

“Beteiligungsbeurteilung” for New COST Action BM0704 (approved)

„Emerging EMF Technologies and Health Risk Management“

A. General

1. Societal and Political Context

In recent years, there has been an unprecedented increase in the use of devices emitting electromagnetic fields (EMF), for example in mobile and other personal radio-communications. This impinges on every aspect of day-to-day living, whether in the home, in public places or at work. While the benefits to society of such technologies are accepted, significant public and media concern continues to be expressed about increases in EMF exposure of people and potential related adverse health effects. Particular concerns relate to the so-called involuntary aspects of EMF exposure and often on the exposure of children or the unborn child.

The key to addressing anticipated public and media concern is foresight in respect of carrying out, coordinating and sharing scientific knowledge of relevant multidisciplinary research. A series of COST Actions were already dedicated to this issue. The approved new Action BM0704 will build on this body of knowledge, on the collected experiences, and on the achieved level of co-operation and scientific exchange.

2. COST Actions 244, 244bis and 281

International coordination of activity in EMF-related scientific research and health risk management has been significantly improved by the activities of previous COST Actions. In 1992, COST Action 244 on “Biomedical Effects of Electromagnetic Fields” started. It was closed 1996, followed by COST Action 244bis (same heading, 1996-2000) and COST Action 281 (“Potential Health Implications from Mobile Communication Systems”, 2001-2006). The Actions were embedded in a network of national and international institutions and research programmes like WHO, ICNIRP, BEMS, EBEA, IEEE, CENELEC, and EU framework research. Through such effective multidisciplinary and cross-institutional scientific collaboration, major improvements in providing stakeholders with information and advice about potential health risks and associated risk-communication strategies were possible.

The objectives of the COST Action 281 have been:

- to obtain a better understanding of possible health impacts of emerging telecommunication technologies that may result in exposure to electromagnetic fields;
- to establish and strengthen a European-wide network of scientists;
- to provide a platform for exchanging information and experience on this research area;
- to contribute to and encourage co-ordinated research.



In order to meet these objectives, six working groups on (i) Genetic and Cytogenetic Aspects, (ii) Mobile Communication and Children, (iii) Base Station Monitoring/Dosimetry, (iv) Statistics, (v) New and Emerging Technologies, and (vi) Epidemiology, were established and 26 workshops were organized. The evaluation of COST Action 281 by the Domain Committee ICT was very favourable and a subsequent Action was encouraged:

“The Action was very good at pooling and collecting data stemming from many national and European projects. It did a satisfying work of European coordination of the vast funds that existed for projects at national level. (...) The value of the results of the COST 281 Action justified the continuation of the process of dissemination of the results obtained (...) Taking into account the importance of the topic “Potential Health Implications from Mobile Communications” and the high quality trademark of COST 281, the continuation of the use of its name for a further possible action should be considered”.

The new Action BM0704 seeks to build upon and strengthen the established co-operative complementary approach with other bodies.

3. Objectives of COST Action BM0704

3.1 Rationale

In spite of years of biological research, there is still some uncertainty about whether chronic exposure to low level EMF is capable of inducing any long-term biological effect, whether any such effect would be based on alterations to cell physiology, and whether such effects could pose a potential health risk. So far, even when biological effects of EMF have been reported, the biophysical mechanisms behind their occurrence remained unknown. Good quality biological research, which is now being carried out, is the key to addressing some of these uncertainties.

3.2 Objectives

The main objective of the Action is to create a structure in which researchers in the field of EMF and health can share knowledge and information on:

1. How existing EMF technologies change either in their operating characteristics or in novel ways and applications in which they are used
2. Identifying what entirely new EMF technologies are introduced and on what time-scale
3. What novel emission and operating characteristics might result and what impact these would have on the device-specific and overall EMF exposure of people
4. What possible health effects could consequently arise and the scientific evidence for health concerns if any
5. How such concerns should be addressed through the use of evidence-based information and
6. What tools are effective in communicating and managing such risks and perceived risks. And, effectively publish all such information in the public sector for the benefit of all stakeholders.



3.3 Scientific Focus

At the outset of the Action, the initial focus will be on those existing EMF technologies where there is already concern about their use and where further developments in respect of their applications are foreseen in the shorter term. These include: WiFi, MRI, Electronic article surveillance and RFID devices. Likely further candidates are, for example: so-called 4G (and further developments in mobile telephony), ad hoc networks, W-LANs, WiMax, Zigbee, Bluetooth, Wimedia, UWB, broad-band over power transmission lines, various EASD and RFID applications and further digital broadcasting.

3.4 Organisation

The Action is structured around the coordinated activities of specific Action Working Groups and through cross-group tasks. Initially, the Action Working Groups will comprise:

- Working Group 1 – EMF Measurement and Monitoring
- Working Group 2 – EMF Computational Dosimetry
- Working Group 3 – Epidemiology
- Working Group 4 – Biology
- Working Group 5 – Risk Communication and Management

3. International Participation

The Action was proposed by Dr. Alastair McKinlay, National Radiological Protection Board, U.K.

It is expected that – compared to COST 281 – even more countries will sign the Memorandum of Understanding. COST Action 281 was supported by 25 countries. 122 scientists have expressed their interest to participate and are listed in the draft Memorandum of Understanding.

B. Swiss Participation

1. Overall Rationale for Swiss Participation

Switzerland participated in COST Actions 244bis and 281. A continuation of exchange on the European level is invaluable for both established as well as younger Swiss scientists in the field. In fact, the proposed Action will be the largest science-based European forum for discussion on EMF and health issues. Swiss research needs to participate in and benefit from this collaborative framework. This is especially important in light of the new National Research Programme 57: “Non-Ionizing Radiation – Health and Environment”

- NRP 57 will offer a series of young scientists the opportunity to embark on a research career. COST BM0704 will provide an excellent platform for these young researchers to exchange with international experts and to integrate into the European scientific community.

A second overall reason for Swiss participation concerns legislation. Exposure limits and implementation of the regulatory framework differ between Switzerland and Europe. Swiss experiences with regard to risk management and risk communication offer an important benchmark for research and communication activities oriented towards information provision to the public and citizen participation.

2. Swiss Research Network

At present, a series of Swiss researchers and research groups work on scientific issues that are covered by the proposed COST Action. To name but two Swiss research programmes: NRP 57 supports 9 Swiss research teams (11 projects), and FSM (Swiss Research Foundation on Mobile Communication) currently funds 4 Swiss research groups. In terms of topics, all relevant EMF related issues are covered by Swiss scientists, i.e. cell biology, in-vivo research, epidemiology, dosimetry, and social science risk research (risk perception and risk communication). The following research organisations will be invited to contribute to the new COST Action. The majority of them have already been conducive to COST 281.

1. Chair of Technology and Innovation Management, ETH Zurich
2. Clinic of Neonatology, University Hospital Zurich
3. Department of Plant Molecular Biology, University of Lausanne
4. Institute of Social and Preventive Medicine, University of Bern
5. Division of Veterinary Pharmacology and Toxicology, University of Bern
6. Health Care Communication Laboratory, Università della Svizzera italiana
7. Institute for Environmental Decisions (IED), ETH Zurich
8. Institute of Biochemistry and Genetics, University of Basel
9. Institute of Pharmacology and Toxicology, University of Zurich
10. Institute of Social and Preventive Medicine, University of Basel
11. IT'IS Foundation for Research on Information Technologies in Society, Zurich
12. Laboratory of Field Theory and Microwave Electronics, ETH Zurich
13. Serec – Swiss Electromagnetics Research & Engineering Centre, ETH Zurich

Participation at COST Action BM0704 will further increase visibility and impact of Swiss research in the area of bioelectromagnetics research.

3. Co-ordination and Management Committee

We propose that co-ordination and participation in the MC will be assigned to the representatives of Switzerland of the former COST Action 281, Gregor Dürrenberger (first delegate), Swiss Research Foundation on Mobile Communication (FSM), and Mirjana Moser (second delegate), Federal Office of Public Health (FOPH).

4. Planned co-ordinated research

4.1 On-going projects (selection)

Title	Institution (# see above)	Funding
Diffusion of wireless technologies and technological lock-in	1	FSM
Effects of UMTS radiation on cerebral blood circulation assessed by near infrared imaging	2	NRP57
Characterisation of effects of non-ionising radiation on the nematode <i>Caenorhabditis elegans</i> as a model organism	3	NRP57
Radio frequency electromagnetic field exposure and health related quality of life: Prospective cohort study	4	NRP57
CEFALO: An international case-control study on brain tumours in children and adolescents	4	FSM
Effects on electromagnetic fields in vitro and in vivo: Identification and characterisation of stress-response pathways	5	NRP57
Structure and effects of societal communication on non-ionising radiation	6	NRP57
Affect and perception of non-ionising radiation: Implications for risk communication	7	NRP57
Genotoxic effects of non-ionising radiation	8	NRP57
Effects of pulse-modulated radio frequency electromagnetic fields on the human brain: Critical field parameters, site of interaction and sensitivity in early adolescence	9	NRP57
Apoptosis in cultured brain cells following exposure to radiofrequency radiation	11	FSM
Determination of the exposure of the fetus to electromagnetic fields in an uncontrolled environment	11	NRP57
Cumulative exposure in time and frequency domains of the central nervous system	11	NRP57
Live cell imaging during EMF exposure	11	NRP57
sXv – NTP/NIEHS	11	NIST/NIEHS
Evaluation of the correlation between RF dosimeter reading and real human exposure	12	FSM
Thermosensor protein GrpE of the heat shock protein Hsp70 system as target for high-frequency electromagnetic fields	12	FSM



4.2 New and anticipated upcoming research

Title	#	Funded	KCHF
Evaluation study of a consulting network for environmental illnesses	4	FSM	100
Information and risk communication platform on NIR	FSM	FSM	120
2-4 new projects in 2008 and 2009	--	FSM	400
Other new research focusing on EMF health or policy issues	--	--	--

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