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of the European Commission Scientific Committees

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Review of Events

INTERNATIONAL SCIENTIFIC CONFERENCE ON ELECTROMAGNETIC FIELDS AND PUBLIC HEALTH, 16-17 NOVEMBER 2011, BRUSSELS

In order to prepare a request for update of two recent opinions of the SCENIHR on electromagnetic fields (EMF) and Health^{1,2}, DG SANCO and the SCENIHR held an international scientific conference on electromagnetic fields and public health. Its specific aim was to identify the sub-areas where the scientific consensus on the potential health effects of electromagnetic fields is sufficiently strong to bring closure, to highlight the sub-areas in need of further investigation, and to develop proposals on a strategy to address the remaining knowledge gaps. The conference also helped identify sources of scientific expertise in these domains. About 300 delegates from 34 countries attended the Conference that was structured in 5 Sessions.

Session 1 explored what are EMF, how they physically interact with the body and what are the exposure limits/restrictions and what are the main issues related to EMF exposure assessment.

Session 2 dealt with the main sources of uncertainty in EMF health research and how they are currently addressed.

Session 3 dealt with the current state of knowledge and identification of the main areas of scientific consensus.

In **Session 4**, the areas of scientific inconsistency and the knowledge gaps were discussed.

The main uncertainties related to ELF exposure and in–vitro studies can be found in genotoxicity, apoptosis, epigenetics (gene and protein expression), combined exposure of EMF and other agents, radical pair mechanisms and degenerative processes. Several factors are likely to contribute to the inconsistencies including: i) (too) large number of variables included in the experiments; ii) experimental protocols not adequately described; iii) lack of replication and confirmation studies.

The main uncertainties and gaps regarding biological effects of low level RF EMF relate also to the limited range of signals tested and in the lack of systematic means of exploring various exposures, biological models, or endpoints. Gaps in laboratory studies include the study of effects on young and juvenile animals (brain development, mechanisms, and cancer), ageing and neurodegenerative disease, thresholds for behavioural modifications, use of relevant and responsive in-vitro models for in-vivo findings, methods for identifying localized heating in the brain and the influence on medical implanted devices.

The main uncertainty and knowledge gap in both epidemiological case-control and cohort studies are related to RF exposure assessment (dosimetry aspects). The methods so far used are prone to bias and objective measures of exposure are needed to reduce uncertainty interpretation of the study results, e.g., by prospective cohort studies.

With respect to research needs, the conference highlighted the need to reinforce studies on the effect of ELF exposure on neurodegenerative diseases, to do more replication studies, to address the new technologies, to study the new systems working at frequencies and modulations not yet fully investigated (LTE, WiFi, high frequency RFID, etc), and to study the effects of the increase of the static magnetic field generated by MRI devices.

The final discussion, **Session 5**, dealt mainly with lessons learned and recommendations for the future. In this session, an interesting discussion about the link between the issues and information presented during the two-day conference and their possible influence on research strategies took place. This highlighted the need for more comprehensive and rigorous exposure assessment, studies of long-term effects, studies of neurodegenerative diseases in all frequency bands, the need for an

inter-/multidisciplinary approach and the need to resolve the inconsistencies and uncertainties in epidemiological studies of RF effects.

More information is available at

http://ec.europa.eu/health/electromagnetic_fields/events/ev_20111116_en.htm

http://ec.europa.eu/health/ph_risk/committees/04_scenihhr/docs/scenihhr_o_022.pdf

http://ec.europa.eu/health/archive/ph_risk/committees/04_scenihhr/docs/scenihhr_o_024.pdf