KUNGL. VETENSKAPSAKADEMIEN
THE ROYAL SWEDISH ACADEMY OF SCIENCES

Comments on the HLEG Draft report.

The National Committee for Radiation Protection Research of the Royal Swedish Academy of Sciences wishes to respond to the report of the High Level Expert Group on European Low Dose Risk Research.

The committee supports the objectives of the HLEG report.

- *To formulate and agree on the policy goals to be addressed by low dose risk research;*
- *To develop a strategic research agenda and road map for such research in Europe;*
- *To specify the essential elements of and next steps for establishing a sustainable operational framework for low dose risk research in Europe.*

A joint strategic research agenda (SRA) for Europe may open up for collaborations, increase the efficiency, and strengthen the possibilities to resolve some of the key issues of low dose radiation risk research. Of special importance will be the construction of a governing body that will provide transparency and involvement of the scientific community.
The HLEG report is composed of a scientific part and the Melodi platform for a European research strategy. Comments are provided on both parts.

Scientific Research Agenda.
In the scientific part five key issues for the future radiation protection research and recommendations on how to address these issues through a strategic research agenda (SRA) are addressed.
These issues are

- *the shape of dose-response for cancer;*
- *tissue sensitivities for cancer induction;*
- *individual variability in cancer risk;*
- *the effects of radiation quality (type);*
- *risks from internal radiation exposure;*
- *risks of, and dose response relationships for, non-cancer diseases.*

The committee supports the choice of the key issues as being of fundamental importance for the low dose risk research. The HLEG report also provides a valuable summary of the current state of knowledge and points out future research direction. This part is by large not controversial as the scientific community has been pointing in the same directions for a number of years. The road map proposed to solve these key issues is very general as presented in section three "State of sciences and main research challenges".
In the legends of the figures presented on the strategies to address the five key issues, the word indicative is used. In our view the report would have been more valuable if further effort and space had been given to this section in order to give a deeper analysis on how to address the five key issues. The impression now is that epidemiology will be the main strategy to solve most of the key issues. Although the value of epidemiology is significant to reach well founded risk estimates, the problem with low dose exposures is how to define cohorts that provide sufficient statistical power. This is pointed out clearly in the report and examples of common problems are given:

- *Over-interpretation of single epidemiological data sets or even single data points on a dose response;*

- *Insufficient attention given to potential confounding factors and biases in epidemiological data;*
- *Insufficient attention given to the statistical power of some studies;*
- *Generalisation of results from atypical or limited experimental models;*
- *Insufficient understanding of low-dose radiobiology.*

When calls for new epidemiological studies are initiated, it is essential that the proposed projects can largely address most or all of the problems listed above.

We would like to stress the importance of mechanistic approaches for the SRA as outlined in the HELG report. A mechanistic approach will provide the platform for the basic understanding of the primary action of radiation and of the biological endpoints of interest to. Mechanistic studies on primary DNA damage, DNA response and repair pathways, genomic instability, individual sensitivity etc. are understood to be an integral part of the HLEG proposal and should be in focus during the initial phase of the SRA.

The MELODI platform

In the second part of the HLEG report the MELODI platform is presented and it is stated that the structure will be further developed before the final form is ready. In the text below we wish to provide some input to this process and highlight the elements we find are especially important.
As defined by the goals listed below, the view is given that the MELODI platform will be the major player for the future radiation protection research program in Europe. Obviously, the responsibilities and demands for objectivity and transparency are extremely high. However, we feel there remain a number of questions that need to be addressed concerning the structure, goals, transparency and financial resources of MELODI platform.

The structure:

As cited from the report "*the main participants in the platform would be national funding bodies and research organisations (i.e., national institutes, universities, etc) with significant low dose risk research activities*".
This raises the following questions:

1. What will be the role of the participating regulatory authorities in terms of financial support and influence on the organisation? This is of principal importance for the credibility of the organisation and the SRA.
2. What does effective links with *key stakeholders, in particular regulatory bodies*" imply in terms of influence and financial support?
3. What procedures will be used for nomination and election of the board and the executive committee members?
4. How will the needs for transparency and objectivity be granted?
5. How will the operational structure of the research programs be organised?
6. How to keep the budget needed for the administration of MELODI at a reasonable level? Based on the past experience from the Euratom programme, about 10% of the total budget could be used for administration.

The Goals:

- *Bring together the programmes of the various funding bodies and research organisations in Europe;*

It is stated that "MELODI would focus on the means to achieve a fully integrated and sustainable approach to low dose risk research in Europe and of the related governance structure. "Bring together" needs clarification in this context. Bring together programmes may be devastating if it implies conformity and less support for basic and some times controversial research.

It will be a challenge to balance the support for research of an applied nature and the basic research as well as the high-risk/high-gain research. These decisions need to be taken in consultation with the scientific community.

The European scientific community should be encouraged to participate in the process of establishing calls for programs, evaluating research proposals and monitoring the performance of approved projects. The process of integration and involvement of experts in all these steps is a key issue for the success of MELODI and should be given high priority.

Because MELODI is expected to become the major player in establishing the research agenda, and be in control of a major part of the funding for radiation protection research, it is important for the credibility of radiation protection research in Europe that alternative funding bodies are available. We suggest MELODI to adopt a policy not to compete for all the available funding for radiation protection research, leaving room for high quality research to be performed by scientists that for different reasons may not take part in the MELODI programs.

- *Establish effective interfaces with stakeholders and the broader scientific and health community in Europe and beyond;*

This is important and deserves serious efforts.

- *Ensure the availability of key infrastructures;*

The lack of infrastructure for low dose and dose rate research is at present a limiting factor for the SRA. A strategy for the upgrading of the infrastructure should be of high priority.

- *Establish an integrated approach for training and education, including knowledge management.*

It may be foreseen that only a few universities in Europe will have the resources to offer a full educational program at the basic as well as the advanced level of subjects such as radiation biology and radiation physics. Thus an integrated approach is needed. In this context a few questions should be asked:

1. How will the interest of those countries that will not be members of the MELODI, but are dependent on the outcome be considered?
2. How will Melody support the needs for national expertise in radiation protection in those countries that do not qualify to be members?

Evaluation process

We suggest that already at the initial stage of planning for the MELODI platform issues related to the evaluation should be discussed and procedures for the evaluation and the performance of MELODI be established.

The agenda for this process as well as how external experts will be selected needs to be defined.

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Mats Harms-Ringdahl

Chairman of the National Committee for Radiation Protection Research.