



# OPERRA

OPEN PROJECT FOR EUROPEAN RADIATION RESEARCH AREA

## MELODI & OPERRA

Establishing a collaborative relationship with NERIS



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Representative of the MELODI Chair





## The MELODI Association

- MELODI is a research platform contributing to the definition of priority objectives in low dose risk research, identification of research programmes and resources to be implemented in order to achieve these objectives
- MELODI publishes a SRA at least once a year (currently the 4<sup>th</sup> version is being updated)
- MELODI comprises 30 members (as of October 2013)



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BELGIUM

SCK-CEN, ISP



BULGARIA

NCRRP

CROATIA

IMROH



CZECH REPUBLIC

UNIVERSITY OF SOUTH BOHEMIA



FINLAND

STUK



FRANCE

CEA, IRSN



GERMANY

BFS, HMGU, KIT, KVSF, UNIVERSITY OF ROSTOCK,

GREECE

DUTH



HUNGARY

HUNGARIA ACADEMY OF SCIENCE, NRIR

ITALY

ENEA, INFN, ISS, UNIVERSITY OF PAVIA

NETHERLANDS

RIVM



PORTUGAL

ITN

SPAIN

CREAL, UAM, URV

SWEDEN

SSM, SU



SWITZERLAND

IRA



UK

PHE, UNIVERSITY OF BELFAST



# The MELODI Research Priorities

## A. Mechanistic studies

A.1. Characterization of spatial and temporal energy deposition events (track structure and dose rate) and their role in low-dose radiation responses (among others, examination of radiation damage and biological effectiveness (RBE) values of different types of radiation)

A.2. Analysis of mechanisms involved in low dose radiation through use and development of suitable cellular models (2D, 3D, including somatic cells, stem cells, and organo-typic tissue models) as well as animal models

A.3. Identification of specific metabolic pathways and tissue biomarkers (e.g., epigenetic profiles) related to radiation specific tissue responses

A.4. Role of genetic background, immunological status, age, gender and lifestyle on radiation-induced effects, as well as identification of other factors influencing individual radiosensitivity



# The MELODI Research Priorities

## A. Mechanistic studies (continued)

A.5. Relationships between radio- and chemical toxicity and their respective influence on radiation-induced effects resulting from incorporation (internal contamination) of radionuclides

A.6. Examination of the mechanisms and effects of mixed (radiation/chemical) and multi-exposure (radiation/radiation) on cells, tissues, animal models and humans

A.7. Examination of possible regenerative processes allowing the promotion of medical countermeasures for the treatment of adverse radiological effects (including the effects resulting from the use of radiation in medical applications)





# The MELODI Research Priorities

## **B. Health risk evaluation studies**

B.1. Identification, development and validation of biomarkers for radiation-induced health (cancer and non-cancer) effects through sound epidemiological studies in children and/or adults in conjunction with most suitable and promising retrospective and prospective cohorts with access to biological samples and sound dosimetry

B.2. Development of mathematical and molecular modeling studies based on findings of mechanistic and epidemiological studies dedicated to low-dose health (cancer and non-cancer) risk evaluation

## **C. Other activities contributing to low-dose risk research**

Development and facilitation of access to infrastructures

Consolidation of major cohorts suitable for molecular epidemiological studies

Maintaining a high level of education and training for radiation protection



## Major challenges for OPERRA

- To build up an umbrella coordination structure that has the capacity in a legal and logistical sense to administer future calls for research in radiation protection as a whole (**including** low-dose risk, radioecology, **nuclear emergency management**, and also research activities related to the medical uses of ionising radiation) on behalf of the European Commission
- To organise a first competitive call for projects in low-dose risk research (2013) and a second competitive call for broader projects in radiation protection research (2014), subject to the approval of EC services



## Topics of the first OPERRA call

- Analysis of mechanisms involved in low dose radiation through use and development of suitable cellular models (2D, 3D, including somatic cells, stem cells, and organo-typic tissue models) as well as animal models
- Determination of the role of genetic background, immunological status, age, gender and lifestyle on radiation-induced effects, as well as identification of other factors influencing individual radiosensitivity
- Identification, development and validation of biomarkers for radiation-induced health (cancer and non-cancer) effects through sound molecular epidemiological studies in children and/or adults in conjunction with most suitable and promising retrospective and prospective cohorts with access to biological samples and sound dosimetry





## Thoughts for the future

- In what extent the possible radiation-induced non-cancer effects (e.g. vascular or cognitive effects) should be considered while evaluating the sanitary detriment for a population chronically exposed to low doses?
- What are the risks attributable to exposures up to 20 mSv along the entire life? Are there specific countermeasures to implement with the view of decreasing the doses received to these populations considering this dose range?
- Eventually how better evaluate the need for and the impact of some mitigation activities regarding the potentially low benefit for the health of exposed people?
- What about defining new stable iodine arrangements in a situation with repeated releases and when evacuation is temporarily unfeasible?



OPERA

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