



DoReMi -  
Low Dose Research towards  
Multidisciplinary Integration

**Publishable Summary**

**Period 2: 1 July 2011 – 31 December 2012**

**Status:** Final version, 30 April 2013

## **1. A summary description of project context and objectives**

The aim of the DoReMi consortium is to promote the sustainable integration of low dose risk research in Europe. This will facilitate efforts to resolve the key policy questions identified by the 'High Level Expert Group (HLEG) on Low Dose Risk Research' ([www.hleg.de](http://www.hleg.de)). These are the shape/s of cancer dose-risk relationship/s, variation in risk between individuals, differences in tissue sensitivities for cancer, effects of radiation quality, risks from internal exposures and the risks of non-cancer effects. The research activities of DoReMi focus on the research areas identified by the HLEG as being the most promising in terms of resolving the stated key policy questions. DoReMi provides an operational tool to continue the development of the MELODI platform (Multidisciplinary European Low Dose Risk Research Initiative) that represents the major national bodies and research programmes with a long term commitment to low dose risk research in Europe. The Joint Programme of Activities (JPA) of DoReMi includes: (i) a Joint Programme of Research (JPR) covering the research priorities (key questions) outlined above and including the sharing and updating of existing infrastructures; (ii) a Joint Programme of Integration (JPI) to promote sustainable integration between the key players in Europe; and (iii) a Joint Programme for the Spreading of Excellence (JPSE), covering in particular knowledge management, training & mobility and the communication of significant DoReMi findings to stakeholders and policymakers. The Joint Programme of Research addresses three main topics: the shape of dose response curve for cancer, effects of individual susceptibilities and the risks of non-cancer effects. Radiation quality, internal exposures and tissue sensitivities are addressed as cross cutting themes within these main research areas. The research activities take a multi-disciplinary approach, including interfacing with the broader (i.e. non-radiation) biological, toxicological and epidemiological research communities. A substantial proportion of the activities of DoReMi are dedicated to the joint programme of research as DoReMi will take the lead towards sustainable integration of low dose risk research in Europe. In the longer term this will aid the resolution of the key policy questions in radiation protection.

Strategic planning of DoReMi activities is carried out in close collaboration with MELODI. The long term Strategic Research Agenda (SRA) for European low dose radiation risk research has been developed by MELODI. DoReMi has formulated research priorities in a Transitional Research Agenda (TRA) that focuses on objectives that are feasible to achieve within the 6 year lifetime of the project and that are in areas where stimulus is needed in order to proceed with the longer term strategic objectives of the SRA.

## **2. A description of the work performed since the beginning of the project and the main results achieved so far**

Since the beginning of the DoReMi Network of Excellence in January 2010, there has been rapid progress in establishment of a European research platform to focus on questions of low dose risk. DoReMi continues the initial work of HLEG by contributing to the development of the long-term SRA of MELODI, and by establishing the more detailed shorter-term DoReMi TRA. The research agendas provided by MELODI and DoReMi have helped to identify priorities for low dose risk research not only by the organisations involved but also in national, European and global contexts. The planned enhancement of the DoReMi network through the calls for partners with new expertises has resulted in the inclusion of 20 new beneficiaries by January 2013. This has enhanced the competence of the consortium in several key areas, by integrating research experts in biomarker identification, immunological/inflammatory pathways, and the effects of chronic low dose exposures, cataractogenesis, stem cells, epigenetics and novel mechanisms of genome

reorganisation. The two DoReMi competitive calls attracted proposals from 83 different organisations in 24 countries (including 20 European MS).

DoReMi is now implementing research programs addressing the three key research areas: shape of dose-response curve for cancer, individual radiation sensitivity for cancer and non-cancer effects. All RTD activities also address the cross-cutting issues of radiation quality, tissue sensitivity and internal emitters. Several workshops have been convened to develop strategies that focus on the most promising lines of research for the three areas. By month 36, experimental programs have been launched and amended in all three areas, including a number of feasibility studies preparing the field for large international collaborative efforts. The RTD approaches have been closely coordinated through discussions on needs for research infrastructures and analytical platforms, as well as targeted stimulation of training and education of next-generation researchers at the European level.

The availability of suitable infrastructures for performing low dose risk research is specifically addressed by DoReMi. Experimental radiation research is highly dependent on the availability of appropriate radiation sources that are reliable, capable of delivering a range of radiations, are robust and accurate. Low dose research also needs access to well defined epidemiological cohorts, reliable databases and biobanks and as well the appropriate platforms for analysis. After the initial mapping of infrastructures and their availability, DoReMi has now provided access to several new infrastructures that will enhance the European capabilities in addressing scientific questions relevant for low dose risk.

More information on current DoReMi activities can be found at the DoReMi website (<http://www.doremi-noe.net/>) which is now fully operational. Dissemination of information on ongoing low dose risk research to the general public, the scientific community, policy makers and stakeholders is an important part of DoReMi networking activity. The publicly accessible part of the site contains general information on scientific aspects of low dose radiation research as well as aspects of training and education activities and of infrastructures. The website is seen as an important tool for internal and external communication. Through the website we will promote interdisciplinary interaction and increase European integration of research as well as facilitate the spreading of knowledge and enhancing our visibility outside of DoReMi. Key documents such as the DoReMi TRA, as well as the links to the MELODI website, other platforms and EURATOM RTD activities can be found on the website. Input from the wider scientific community is actively encouraged via the website to allow efficient development of new research strategies within DoReMi and MELODI.

### **3. The expected final results and their potential impact and use (including the socio-economic impact and the wider societal implications of the project so far)**

Although much is known about the quantitative effects of exposure to ionising radiation, considerable uncertainties and divergent views remain about the health effects at low doses. In 2009, the European High Level and Expert Group (HLEG) identified a series of key policy questions to be addressed by a strategic European research agenda. This resulted in the establishment of the MELODI European Research Platform, Multidisciplinary European Low Dose Research Initiative) to sustain the impetus and continue evolution of the research programme via the SRA. DoReMi will act as an operational tool for the sustained development of the MELODI platform during the next years, creating sustainable integration of European research on low dose risk and providing answers to key policy questions. The DoReMi joint programme for research focuses on the areas identified by the HLEG and MELODI as being the most promising in terms of addressing and resolving the key policy questions. By addressing the scientific basis underlying the system of radiation

protection DoReMi is contributing directly to strengthening the credibility of scientific evidence relevant to the development of radiation protection policy. Ultimately DoReMi can be expected to contribute more widely to radiation protection through engagement with International Commission on Radiological Protection and other national and international bodies. The High Level and Expert Group pointed out that many EU member states have lost key competences and are no longer capable of independently retaining their current research activities in radiation sciences, with implications for effectively fulfilling operational and policy needs and obligations. Up-to-date research and education and training activities carried out by DoReMi and MELODI are urgently needed to ensure the European competence in radiation sciences and radiation protection.

The experiences on integration of research gained by MELODI and DoReMi will be exploited when preparing for the Horizon 2020. By now, Strategic Research Agendas have been prepared not only for low dose risk research but also for radioecology and emergency preparedness. It is now possible to bring together all these platforms under one umbrella structure, addressing research on radiation protection.

**Attachment to Publishable Summary:****DoReMi List of beneficiaries:**

(Note that the beneficiaries 23-32 joined the project on 1 January 2013 onwards, from the beginning of the 3rd reporting period.)

<b>Beneficiary no.</b>	<b>Beneficiary name</b>	<b>Beneficiary short name</b>	<b>Country</b>	<b>Date enter project</b>	<b>Date exit project</b>
1 (Coordinator)	Radiation and Nuclear Safety Authority	STUK	Finland	1	72
2	Institut de Radioprotection et de Sûreté Nucléaire	IRSN	France	1	72
3	Helmholz Zentrum München	HMGU	Germany	1	72
4	Commissariat à l'Energie Atomique	CEA	France	1	72
5	Health Protection Agency	HPA	UK	1	72
6	University of Pavia	UNIPV	Italy	1	72
7	Istituto Superiore di Sanità	ISS	Italy	1	72
8	Belgian Nuclear Research Centre	SCK-CEN	Belgium	1	72
9	Bundesamt für Strahlenschutz	BfS	Germany	1	72
10	University of Stockholm	SU	Sweden	1	72
11	Centre for Research in Environmental Epidemiology	CREAL	Spain	1	72
12	Institut Curie	IC	France	1	72
13	Universitaetsklinikum Erlangen	UKER	Germany	19	72
14	Johann Wolfgang Goethe-Universitaet, Frankfurt am Main	GUF	Germany	19	72
15	Universitaet Rostock	UROS	Germany	19	72
16	Norwegian University of Life Sciences	UMB	Norway	19	72
17	Norwegian Radiation Protection Authority	NRPA	Norway	19	72
18	Nasjonalt Folkehelseinstitutt	NIPH	Norway	19	72
19	Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenibile	ENEA	Italy	19	72
20	Institute for Environmental Sciences	IES	Japan	19	72
21	Dublin Institute of Technology	DIT	Ireland	19	72
22	Erasmus Universitair Medisch	Erasmus	Netherlands	19	72

	Centrum Rotterdam				
23	Oxford Brookes University	OBU	UK	37	72
24	Brunel University	UBRUN	UK	37	72
25	“Frédéric Joliot Curie” National Research Institute for Radiobiology and Radiohygiene	NRIRR	Hungary	37	72
26	National Radiation Protection Institute	SURO	Czech Republic	37	72
27	NUVIA Limited	NUVIA	UK	37	72
28	Atomic Weapons Establishment	AWE	UK	37	72
29	Universitaet des Saarlandes	USAAR	Germany	37	72
30	Leiden University Medical Center	LUMC	Netherlands	37	72
31	Universität der Bundeswehr München	UBWM	Germany	37	72
32	Ludwig-Maximilians- Universität München	LMU	Germany	37	72

**DoReMi Logos:**

Horizontal:



Vertical:



## DoReMi WP structure and WP leaders

