



Work package 5 – Shape of the dose-response curve for cancer

It is generally acknowledged that there are good quantitative data on radiation cancer risk for exposures of 100mSv and above from epidemiological studies of human populations. For in utero exposures elevated risk can be detected at lower levels, of the order of 10mSv. On the basis of the observed form of the dose-response relationships for radiation cancers and biophysical arguments a linear or non-threshold extrapolation is used to assess radiation cancer risk at low (<100 mSv) exposure levels. More confidence in low dose risk estimation could be obtained through a better understanding of the form of the dose-response for cancer at low doses, and its dependence on tissue type.

Following the lead provided by the HLEG report (www.hleg.de), WP5 has two main objectives:

- To improve knowledge of low dose/dose rate radiation cancer risk in humans
- To improve low dose/dose-rate risk projection models based on knowledge of the processes that drive carcinogenesis.

Most efforts focus on the second objective. The work package is organised into six tasks and updates on each are provided below.

Task 5.1 considers phase-shifts in responses and processes operating at high/low doses and dose rates. The work currently centres on studies of stress responses in primary human cells, identifying and validating low dose radiation gene expression profiles and developing in vivo reporter genes of radiation response.

Task 5.2 aims to assess the contribution of non-targeted and systemic processes to radiation carcinogenesis. The main experimental work in this area started following the first DoReMi external call, priorities for which were discussed at a workshop held in June 2010.

Task 5.3 focuses on the dynamics of preneoplastic change and clonal development and exploits a well-characterised mouse model of radiation leukaemogenesis. Experimental work aims to identify key events in carcinogenesis and explore dose-response and time course relationships. Partners HPA, HMGU, SCK•CEN and CEA are actively involved in this research.

Task 5.4 aims to link experimental and epidemiological data through mathematical models, significant interaction and synergy with the recently started EpiRadBio project is expected.

Task 5.5 concerns risks from internal contamination with radionuclides. A workshop was held in March 2011 to identify research priorities and plan linked epidemiological and experimental studies of internal emitter risk. This discussion was successful in identifying priority issues that will help inform future calls for proposals.

Task 5.6 has just started this year and will apply Monte Carlo modelling methods and experimental approaches to improve relative biological effectiveness (RBE) estimates for a range of radiation qualities.

For more information on these tasks, see [WP5 page](#) on the DoReMi website.

Simon Bouffler



DoReMi-2012 competitive call

The DoReMi-2012 competitive call announcement and related documents are available [here](#). The call will close on 18 April at 17.00 Brussels time. Submit a proposal before the deadline!

TRA commenting possibility

The [DoReMi Transitional Research Agenda \(TRA\)](#) needs regular updating since it wants to reflect as much as possible the views and interests of the wider scientific community, stakeholders and the public. If you want to participate in this process, see the commenting possibility [here](#).

DoReMi – STORE cooperation

A joint Workshop by DoReMi and STORE (Sustaining access to tissues and data from radiobiological experiments) was organised on 25–26 January 2012 in Rome, Italy. As a result, an [editorial in Nature](#) was published. See also [the presentations](#) available in [STORE website](#) and [the meeting report](#). DoReMi and STORE have signed a Memorandum of Understanding and future cooperation is expected.

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DoReMi and related events

Future events

- **4th International MELODI Workshop**, 12–14 September 2012 in Helsinki, Finland. The registration and poster abstract submission have now been opened. Please visit www.melodi2012.org for more information.
- **5th International Systems Radiation Biology Workshop** (co-sponsored by DoReMi), 2–5 September 2012 in Oxford, UK. See the [course announcement](#). Details on possible one-day pre-workshop training course will be announced later.

Past events

- **DoReMi Stem Cell and DNA Damage Workshop**, 7–8 December 2012 in Oxford, UK. See [Workshop programme](#) and [Workshop report](#) available in the DoReMi website.
- **DoReMi Workshop Task 7.2** "Determination of strategies to conduct molecular epidemiology studies in vascular radiation damage," 19–20 October 2011 in Munich, Germany. See the [presentations and meeting report](#).

Highlights and interesting documents available

- *Meeting report from DoReMi workshop on multidisciplinary approaches to evaluating cancer risks associated with low-dose internal contamination (Laurier et al) organized in March 2011 has been published in Radioprotection 2012 Vol. 47, n° 1. The publication is available [here](#).*

