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D3.6 – If extra funding is available: Fifth Joint Priority List

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PRIORITY SETTING within the Joint Roadmap

No extra funding was foreseen for a call for scientific projects within CONCERT. Therefore there is no need to update the short-term joint priority list that was presented in Deliverable D3.3, often referred to as the “Gap Analysis”.

On the other hand the joint roadmap has been updated recently within CONCERT WP3. This is a guide for long-term planning of radiation protection research. All platforms contributed actively in the updating of the joint roadmap. A new version of the joint roadmap has been submitted as D3.7 to the Commission early 2020 and was approved. Within this document a list of Game Changers has been defined for the first time. The Game Changers are defined as research issues that, when successfully resolved, have the potential to impact substantially and strengthen the system and/or practice of radiation protection for man and/or the environment through 1) significantly improving the evidence base, 2) developing principles and recommendations, 3) developing standards based on the recommendations and 4) improving practice. The Game Changers are included for information in Table 1. This Game Changer list may be regarded as a list of the most important priorities within the joint roadmap. The CONCERT POMs and Stakeholders will be consulted within the last months of the CONCERT project to evaluate the priority of the different Game Changers.

Networking activities encouraging joint priority setting

The radiation protection research platforms continue to encourage integration of research activities of common interest through several networking and common priority setting activities. These activities have been partially supported by CONCERT WP2 and WP3.

A fourth radiation protection week was organized by MELODI, EURADOS, NERIS, ALLIANCE, EURAMED and the newly established platform SHARE in Stockholm, 14-18 October 2019. One of the highlights of the workshop was the session “quo vadis” where the platforms presented their common objectives for active collaboration within the field of Radiation Protection Research beyond H2020. The platforms are also actively following up the establishment of Horizon Europe.

The abovementioned platforms will sign a Memorandum of Understanding for collaboration and further integration of activities of common interest during the CONCERT final meeting. This memorandum will replace the former memoranda that were set up before all platforms were established (notably the memoranda between MELODI-EURADOS-NERIS-ALLIANCE, and MELODI-EURADOS-EURAMED, respectively).

The radiation protection platforms MELODI, EURADOS, ALLIANCE and NERIS were invited to the ICRP liaison meeting “7th Annual Meeting of Senior Representatives of Organisations in Formal Relations with ICRP”. The ICRP liaison meeting was held 16/9/2019. This meeting focused on 2 questions notably (1) “*In practice, what further is necessary to integrate protection of the environment in radiological protection?*” and (2) “*What would be the practical implications of a more individualised system of radiological protection based on variations in individual response to radiation exposure?*”. These questions, of practical relevance, may benefit from research proposed in Game Changers A3 and F3, respectively (Table 1).

The radiation protection research platforms are also in contact with NUGENIA to identify topics of common interest for potential common projects. A meeting was held in Paris on 5-6 February 2020. Three different topics were identified and will be elaborated in the next months, notably TOPIC 1. Source term calculation / estimation; TOPIC 2. Future of nuclear energy in Europe and how risks, benefits and potentials are seen by stakeholders; TOPIC 3. Enlarging the nuclear workers cohorts. These topics fit into Game Changers F1, H1, and A1-3, respectively (Table 1).

Table 1 Game Changer list, involvement of radiation protection research platforms and intended end users

Game Changer No	Game Changer title	RPR platforms involved	End users
A1	Define the risks of non-cancer diseases at low and intermediate dose levels (100 - 500 mGy and below).	MELODI	UNSCEAR, ICRP, IAEA, legislators, and regulators
A2	Integration of epidemiological estimates of cancer risk with a more complete understanding of radiological disease pathogenesis to improve cancer risk assessment	MELODI, EURAMED, SHARE	UNSCEAR, ICRP, IAEA, legislators, and regulators
A3	Characterisation and quantification of variation in radiation response and risk between population sub-groups/individuals due to genetic factors, sex, co-morbidities, dedicated exposure of diseased areas in patients, environmental and lifestyle factors and the interactions between these depending on dose-levels.	MELODI, EURAMED	UNSCEAR, ICRP, IAEA, legislators, and regulators
A4	Define how the temporal and spatial variations in dose delivery affect the risk of health effects following radiation exposure.	MELODI, EURADOS	UNSCEAR, ICRP, IAEA, legislators, and regulators
B1	To improve the understanding of spatial correlations of radiation interaction events by improved measurement and simulation techniques.	EURADOS, MELODI	UNSCEAR, ICRP, IAEA, legislators, and regulators
B2	To quantify correlations between track structure and radiation damage	EURADOS, MELODI	UNSCEAR, ICRP, IAEA, legislators, and regulators
C1	Lifting the controversy with regard to the effects on wildlife reported in the Chernobyl and Fukushima exclusion zones	ALLIANCE, MELODI, EURADOS, NERIS, SHARE	UNSCEAR, ICRP, IAEA, Legislators, and regulators
C2	Determine the effects of radiation on ecosystem functioning	ALLIANCE, MELODI, EURADOS, NERIS, SHARE	UNSCEAR, ICRP, IAEA, legislators, and regulators
D1	Develop new medical applications or optimize existing ones depending on disease related applications e.g. interventional procedures, CT based approaches, targeted therapies in nuclear medicine and particle based therapies, to improve patients protection relying on corresponding improved dosimetry procedures for individual patients	EURAMED, EURADOS, MELODI	Health care providers, legislators and regulators
D2	Application and development of AI methods to improve patient protection relying on suitable clinical data structures and taking into account the limits of the use of AI especially in the medical field.	EURAMED, SHARE	Health care providers, legislators and regulators
D3	Investigating key challenges and problems for the transfer of developments into clinical practice, evaluate conditions leading to large differences throughout Europe, defining standards for justification of applications depending on individual patient characteristics and benefit-risk evaluations of procedures, a dedicated education guaranteeing the best possible radiation protection for patients	EURAMED, EURADOS, SHARE	Health care providers, legislators and regulators

E1	Development of biokinetic models and personalised dosimetry that will lead to the improvement of the assessment of internal exposure	EURADOS, EURAMED, MELODI	UNSCEAR, ICRP, IAEA, legislators, and regulators
E2	The development of real time practical individual dosimetry of workers by harnessing the developments in new connected technologies	EURADOS, EURAMED	Operators, regulators
E3	Development of a practical neutron personal dosimeter	EURADOS	Operators, regulators
F1	Getting a robust prediction of the human food chain radiological contamination, for an integrated dose and risk assessment of (post)emergency situations	ALLIANCE, MELODI, EURADOS, NERIS, SHARE	UNSCEAR, ICRP, IAEA, legislators, and regulators
F2	Identifying and quantifying the key processes that influence radionuclide behaviour in existing environmental contamination situations	ALLIANCE, MELODI, EURADOS, NERIS, SHARE	UNSCEAR, ICRP, IAEA, legislators, and regulators
F3	Integrating risk assessment and management (consistent exposure assessments for humans and wildlife; risk integration for radiation and other stressors)	ALLIANCE, MELODI, EURADOS, NERIS, SHARE	UNSCEAR, ICRP, IAEA, legislators, and regulators
G1	Change of radiological impact assessments, decision support and response and recovery strategy by Artificial Intelligence and big data	NERIS, ALLIANCE, SHARE, EURADOS	UNSCEAR, ICRP, IAEA, legislators, regulators, local authorities
G2	Further development of risk assessment and risk management approaches and technological capabilities to cope with novel threats and accident scenarios arising from new and future nuclear and radiological technologies	NERIS, ALLIANCE, SHARE, EURADOS	UNSCEAR, ICRP, IAEA, legislators, regulators, local authorities
H1	Better alignment of research and practice in RP with the values, needs and expectation of society, through effective research translation mechanisms, development of systematic approaches to inclusion of societal dimensions at all levels of the RP system and methodological innovation enabling transdisciplinarity in RP research	SHARE, MELODI, EURADOS, NERIS, ALLIANCE, EURAMED	Radiation protection community and society

INDIVIDUAL PRIORITY SETTING ACTIVITIES organised by the PLATFORMS

The most important priority setting within the different areas of radiation protection research has been reported by the platforms individually in the annual statements in November 2019, presented in CONCERT Deliverable D2.13.

MELODI organized on 10-12 April 2019 a second scientific workshop on non-cancer effects in Sitges, Spain. The outcome of this workshop will be published in the scientific literature. A third workshop on dose inhomogeneities is planned for spring 2020 (organized by MTA-EK), and a fourth one on Adverse Outcome Pathways (AOP) in 2021 (organised by IRSN). AOP is a tool to elucidate mechanisms in cells, organs, tissues and up to the systemic level induced by various stressors.

MELODI participated to the NEA/CRPPH scoping meeting on Global coordination of Low-Dose Research 5/12/2019 through video conference (Nathalie Impens) and to the IDEA (International Dose Effect Alliance) workshop organized by Electric Power Research Institute in North Carolina, 3-4 December 2019 (physical representation by Laurence Roy).

EURADOS The updated SRA from EURADOS has been distributed to all the Voting Members for comments. This new SRA was also presented to the General Assembly during the last Annual Meeting in February 2020 in Firenze. By the beginning of May 2020, the SRA will be considered final and will be published as a EURADOS report. In case of new funding possibilities, a new voting on the priorities will be organised among the EURADOS community based on the challenges listed in the new SRA.

NERIS has updated its SRA during the last few months. A first draft was presented at the occasion of the NERIS workshop held in Roskilde (Denmark) from 3 to 5 April 2019 to get comments from the NERIS community and from international organisations. After a consultation period, a dedicated meeting of the NERIS R&D committee and Management Board was organised on 25-26 July 2019 in Fontenay-aux-Roses (France), including a discussion on the report under preparation by ICRP on emergency and recovery issues. In addition, the updated version of the NERIS SRA has been presented and discussed during the final events of the on-going CONCERT research project in interaction with NERIS: ENGAGE project (11-13 September 2019, Bratislava); TERRITORIES project (12-14 November 2019, Aix-en-Provence); CONFIDENCE (2-5 December 2019, Bratislava). Another interaction is planned at the occasion of the SHAMISEN project stakeholder workshop to be held on March 9-10 in Barcelona.

Following the publication of the updated version of the NERIS SRA and based on the game changers identified during the preparation of the Joint Roadmap, NERIS will organise a dedicated meeting to improve its roadmap on May 26, 2020 in Barcelona, and will interact at the occasion of its workshop to be held on May 27-29, 2020.

ALLIANCE participated to the abovementioned common networking and priority setting activities, and organized a series of video conferences and e-mail interactions to contribute to the establishment of the Joint Roadmap. No further physical workshops were organized by ALLIANCE in the context of CONCERT WP3. The outcome for the the CONFIDENCE workshop (CONCERT WP 9, September 2019) with stakeholders to identify future research priorities for human food chain research was considered to feed into the revised SRA and the Game Changers.

EURAMED: participated to the abovementioned common networking and priority setting activities including the gap analysis, and organized a series of video conferences and e-mail interactions to contribute to the establishment of the Joint Roadmap. Although, no further physical workshops were organized by EURAMED in the context of CONCERT WP3, the EURAMED SRA was extensively presented

and a topic of discussion during various meetings including at the ERPWs. EURAMED will seek to expand its priority setting activities during the course of the upcoming EURAMED rocc-n-roll project.

SHARE organised the RICOMET conference on social sciences and humanities in ionising radiation research which took place in Barcelona from 1-3 July 2019. There were three workshops and eight sessions. The sessions allowed researchers to present and discuss research results focused on communication about indoor radon, long-term exposure situations, uncertainties in the early and intermediate phases of nuclear or radiological emergencies, the art and culture of radiological protection, etc. The session sponsored by CONCERT was devoted to early career researchers in the field of social sciences and humanities related to ionising radiation.

SHARE is currently expanding the existing SRA focused on radiation protection (published in 2019) to include research priorities related to radioactive waste management, nuclear energy, medical applications, etc. For this, SHARE has established a working group to expand the SRA and identify further priorities. The expanded SRA will be discussed and validated at the next RICOMET and SHARE Assembly which will take place in Athens in September 2020.