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D7.7 – 1st Report on E&T activities such as student placement, courses seminars, workshops, etc. in RTD Call 1

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Abstract

One of the aims of the first transnational call for proposals on “Radiation Protection Research in Europe” through the EJP CONCERT was to actively integrate E&T activities and collaboration with universities in multidisciplinary research projects.

The three projects – CONFIDENCE, TERRITORIES, LDLensRad – supported in the call started their work at the beginning of 2017. One of their specific aims was to initiate an efficient education and training programme on the field of their specific scopes.

These E&T programmes have promisingly started and are expected to achieve their aims until the end of the CONCERT project.

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Introduction

The first transnational call for proposals on “Radiation Protection Research in Europe” through the EJP CONCERT was issued in 2016. The aims of the call were:

- To support transnational research projects that combine innovative approaches in the field of radiation protection in line with the research priorities of CONCERT;
- To actively integrate E&T activities and collaboration with universities in multidisciplinary research projects;
- To make optimal use of research infrastructures.

As the outcome of the call three projects were supported. These are:

- **CONFIDENCE** - COping with uNcertainties For Improved modelling and DEcision making in Nuclear emergenCiEs
- **LDLensRad** - Towards a full mechanistic understanding of low dose radiation induced cataracts
- **TERRITORIES** - To Enhance unceRtainties Reduction and stakeholders Involvement TOwards integrated and graded Risk management of humans and wildlife In long-lasting radiological Exposure Situations

The **TERRITORIES** project targets an integrated and graded management of contaminated territories characterised by long-lasting environmental radioactivity, filling in the needs emerged after the recent post-Fukushima experience and the publication of International and European Basic Safety Standards. A graded approach, for assessing doses to humans and wildlife and managing long-lasting exposure situations (where radiation protection is mainly managed as existing situations), will be achieved through reducing uncertainties to a level that can be considered fit-for-purpose. This project will interlink research in sciences supporting radiation protection (such as radioecology, human or ecological dose and risk assessments, social sciences and humanities, etc.), providing methodological guidance, supported by relevant case studies. The overall outcome will be an umbrella framework, that will constitute the basis to produce novel guidance documents for dose assessment, risk management, and remediation of NORM and radioactively contaminated sites as the consequence of an accident, with due consideration of uncertainties and stakeholder involvement in the decision making process. The results will be widely disseminated to the different stakeholders and accompanied by an education and training programme.

LDLensRad aims to address a number of key research questions on radiation effects on the ocular lens, including: how does low dose radiation cause cataracts; is there a dose rate effect, and how does genetic background influence cataract development after radiation exposure. The research will also address the issue of aging in a sensitive subset of mice and whether lens effects can be viewed as global biomarkers of radiosensitivity. The collaborators will work with mouse models supported by cellular studies to investigate the mechanistic chain of events from the initial radiation insult and biological responses through to formation of lens opacities. The biological investigations will be supported by rigorous statistical modeling for hypothesis development. In addition, the partners will explore the potential for a prospective molecular epidemiology program.

CONFIDENCE aims to close existing gaps in several areas of emergency management and long-term rehabilitation. It concentrates on the early and transition phases of an emergency, but considers also longer-term decisions made during these phases. The project brings together expertise from all four Radiation Protection Platforms and also from Social Sciences and Humanities, such that it can address the scientific challenges associated with model uncertainties and improve radioecological predictions and emergency management (NERIS and ALLIANCE), situation awareness and monitoring strategies

(EURADOS), risk estimation in the early phase (MELODI), decision making and strategy development at local and national levels (NERIS) including social and ethical aspects (Social Sciences and Humanities).

The scope of the current deliverable is to report on E&T activities of the CONFIDENCE, LDLensRad and TERRITORIES projects.

Achievements

Education and Training within the CONFIDENCE Project

E&T (led by VUJE) is a key part of CONFIDENCE and is integrated into the research programme. Proposed activities and their fulfilment will be conducted by the project participants in collaboration with academic departments' out with the core consortium. Educational materials as well as lectures and round table discussions are planned to be conducted at the universities such that they reach the next generation of Radiation Protection specialists. Professional and student training courses are planned. CONFIDENCE will liaise with the European Platform for Education and Training in Radiation Protection (EUTERP) in her activities.

To aid robust decision making one task will develop and conduct a training course and education materials for decision makers and stakeholders. Guides and recommendations for the decision making in the transition and post release phase will be tested. Attendees will debate how to interpret, use and communicate uncertainties within the decision making process. The workshop will also consider the: establishment and optimisation of remediation strategies; benefits of stakeholder involvement; inclusion of human behaviour, cultural differences and stakeholder preferences as a part of the tools to aid decision making.

Course contents

- Uncertain information and how it is used by decision makers at various levels within the decision making process:
 - Meanings of different types of uncertainty,
 - Uncertainties in the early and transition phase,
- Establishment and optimization of remediation strategies:
 - Addressing the uncertainties in urban/inhabited scenarios,
 - Addressing the uncertainties in agricultural scenarios,
- Guidelines and recommendations for decision making during the transition phase,
- Visualization of uncertainties in model results and information for decision making,
- Robust decision making,
- Application of tools (MCDA multi-criteria decision analysis and ABM - agent based modelling) in stakeholder workshops taking into account uncertain information,
- Involvement of stakeholders in decisions to recover for improving their living conditions,
- Uncertainties in human behavior, cultural differences and stakeholder preferences as a part of the tools and approaches to support the decision making process,
- Test of communication tools through consideration of uncertainties within the decision making process,
- Stakeholders' preferences and priorities concerning uncertainty management,
- Application of guidelines and tools for communication and stakeholder involvement related to uncertainty.

The training course/workshop under this task will take place in Trnava, Slovak Republic from May 13-16, 2019 in premises of VUJE and is limited to 24 participants.

In another task a training course/workshop will be developed and conducted in close collaboration with WP3 activities considering the derivation and application of 'process' based models to predict radionuclide activity concentrations in foodstuffs. The course will be for students and professionals and aims to transfer knowledge from the experience gained by WP3. The course will include the application of different model types to scenarios. Attendees will debate the merits, limitations and appropriate applications of process based models versus empirically based models. The training course/workshop under this task will take place in Madrid, Spain through 9-11 September 2019.

In a third task a series of lectures and round table discussions will be developed and held in collaboration with faculties of crisis management, communication and media studies at universities in Belgium, Norway, Slovakia and Italy. The aim is to engage a new generation of specialists in radiation protection issues. The lectures will consider how to: use and report uncertain information; communicate on ionising radiation, exposure situations and radiological risk; communicate protective measures and actions to improve public response and maximize health protection. An important component of the courses will be to consider interaction with and between decision makers, spokespersons and journalists. For the lectures under this task, universities from Belgium, Norway, Slovakia, Italy and in addition from Spain, Germany and Slovenia have been addressed. All participants will be asked to respond to the anonymous CONFIDENCE course questionnaire in order to collect a feedback and improve course.

Education and Training within the LDLensRad Project

Education and Training under LDLensRad has focused on training of PhD students (6 in total at PHE, HMGU and ENEA) and early career scientists. In particular, PhD students have attended compulsory postgraduate training at their associated universities, with basic training including statistical analysis methods (also offered in on the job training), ethics and report writing. On the job training has included development of relevant radiobiological techniques and (for PHE staff) personal licenses for animal handling.

All project members, especially the early career scientists, have been actively encouraged to present at LDLensRad meetings including the Kick-off meeting (May 2017), informal short meetings, and the UK early career scientists contributed to the LDLensRad UK Medical Professional, Patient and Public engagement workshop recently held at PHE (May 2018). The ability to speak to both scientific and lay audiences is a key skill which has been developed through these opportunities.

In addition, LDLensRad early career scientists have contributed to the revised COST 'RAPKEYS' proposal for a network of early career scientists in the radiation research disciplines. The proposal was submitted in April 2018 and the outcome should be available in October 2018.

The LDLensRad had an oral presentation at the 2017 Annual Meeting of the UK Association for Radiation Research (ARR 2017) held at St Hilda's College in the University of Oxford on 27–28 June 2017. The presentation was entitled "LDLensRad: Towards a full mechanistic understanding of low dose radiation induced cataracts".

The LDLensRad also had an oral presentation at the 4th International Symposium on the System of Radiological Protection/the 2nd European Radiation Protection Research Week (ICRP/ERPW2017) held at Newport Bay Club in Disneyland Resort Paris, France, on 10–12 October 2017. The presentation entitled “LDLensRad: Towards a full mechanistic understanding of low dose radiation induced cataracts”.

Education and Training within the TERRITORIES Project

TERRITORIES WP4, i.e. CONCERT Subtask 9.3.4 is entitled ‘Strategic and integrated communication, education and training’, and led by University of Tartu. It aims to share with a wide audience (stakeholders and decision-makers, young scientists, students) the methodological approach and novel guidance documents developed by TERRITORIES. Regarding specifically E&T, the deliverable D9.79 of July 2017 :

- provided an overview of TERRITORIES E&T Plan, Platform and Workshops,
- introduced the two workshops organized in November 2017 in Oslo,
- described allocation of a “flexible funds” budget to cover costs of Workshops organised in June 2018 in Madrid, Spain and in March 2019 in Oxford, United Kingdom, including scholarships for students and post—docs.

As all TERRITORIES deliverables, this D9.79 is available on the TERRITORIES website (<https://territories.eu/publications>) as well as on the CONCERT website.

A webpage is dedicated to the workshops, <https://territories.eu/workshops>, including:

- summary of the two Oslo workshops about **Key factors contributing to uncertainties in radiological risk assessment** and about **Communication of uncertainties of radiological risk assessments to stakeholders**, and links to conclusions in two deliverables (D9.73 and D9.75),
- announcement of the Madrid workshop.

Another webpage is dedicated to the scholarships: <https://territories.eu/scholarships>

Finally, the TERRITORIES dissemination webpage (<https://territories.eu/dissemination>) and the TERRITORIES blog (<https://territoriesweb.wordpress.com/>) are specifically dedicated the dissemination of all TERRITORIES results and news, including educational and training opportunities.

Conclusions

The three projects – CONFIDENCE, TERRITORIES, LDLensRad – supported in the 1st transnational call for proposals on “Radiation Protection Research in Europe” through the EJP CONCERT started they work basically at the beginning of 2017. One of their specific aims was to initiate an efficient education and training program on the field of their specific scopes. These E&T program have promisingly started and are expected to achieve their aims until the end of the CONCERT project.