Editorial

Data sharing and open access are facilitating and accelerating research, making it more reliable and eliminating duplication of effort. The role of the funding agencies and the editorial policies of science journals are crucial in maximising the usage and trustability of the data produced. All funded projects now have to implement data sharing strategies. In CONCERT, the LDLensRad project (Towards a full mechanistic understanding of low dose radiation induced cataracts) has been a "test case" for integrated data sharing. The project includes in vivo, in vitro and theoretical/informatics/statistical components, and the different data produced (e.g. Optical Coherence Tomography and Pentacam images) will be deposited in STORE. The biggest problems in data sharing are cultural and educational, so we would encourage you to establish a proper data management plan at the design stage of your projects and to start sharing your radiation research data through STORE!

Dr Laure Sabatier, CEA

The floor to...

The European NORM Association (ENA), established in 2017, brings together European expertise in the field of NORM (Naturally Occurring Radioactive Materials). ENA intends to act as a counterpart to industry, authorities and research & service providers. Our mission is to promote and advance radiation protection in the context of exposure to NORM by:

- Operating as a European platform and forum for discussion, dissemination and exchange of information, training and education,
- Supporting scientific knowledge acquisition and new directions of research related to NORM,
- Providing unbiased consultation at European level in the context of new regulations.

The overarching objective of the ENA is to support the management of NORM in compliance with European standards and according to best practice in order to minimise legal and regulatory uncertainty and optimise the protection of humans and the environment. Thus, ENA complements existing European platforms by addressing both the generic and practical aspects of radiation protection.

ENA is a platform of experts from different sectors:

- Industry operators and associations,
- Regulatory authorities in the field of radiation protection,
- Service providers such as laboratories and consultants,
- Research and scientific organisations.

ENA’s activities include, but are not limited to:

- Organising conferences and workshops,
- Providing a network of specialists throughout the EU,
- Serving as an unbiased counterpart for establishing regulations and guidelines,
- Establishing close links with “NORM involving” industries associations,
- Forming strong relationships with IRPA, IAEA and national RP associations,
- Undertaking data collection and analysis for both practical and scientific use,
- Establishing links with European radiation protection research platforms, European Radon Association and other networks.

Working groups have been set up with participants from industry, research organisations and authorities on following themes:

- NORM in building materials
- NORM in industries
- NORM in the environment with current sub-themes on the development of training material, and an integrated approach to risk assessment and risk communication.

ENA membership is open to individuals and organisations.

Rob Wiegers
President of ENA

Contacts:
Rob Wiegers: r.wiegers@ibrconsult.nl
ENA executive board: board@ena-norm.eu
ENA secretary: secretary@ena-norm.eu

European NORM Association established as a meeting point for all NORM practitioners, regulators and scientists

Save the date: 14/10/2019
Next WP6 meeting during the 4th ERPW, Stockholm, Sweden
The first version of CONCERT’s Web-handbook (D6.4) is now online!

Air²D:
- Please complete the online form(s) to register your infrastructure(s) in the database.

Follow STORE on Twitter:
@STOREDatabase

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- Exposure platforms (LERF)
- Databases, Sample banks, Cohorts (IMMO-LDRT01 cohort)
- Radiochemical Analysis and Radioactive Analysis Laboratory (INTE-UPC)

Next issue
June 2019
LERF
Low-Dose Radiation Effects Research Facility at IES

The Institute for Environmental Sciences (IES) was established in Rokkasho in Aomori, Japan in 1990 to evaluate the safety and effects of radiation and radionuclides in humans and on the environment in response to public concern over the creation of the Spent Nuclear Fuel Reprocessing Plant.

One of the mouse irradiation rooms in the SPF Facility

The LERF or Low-dose radiation Effects Research Facility, a specific pathogen-free (SPF) mouse facility, was first opened in March 1996 and later underwent a complete renovation in 2014 including replacement of the radiation sources. The facility is environmentally controlled and is maintained at 23±2°C with 50±10% humidity, +6mm Aq atmospheric pressure with a 12 hour light/dark cycle, and is supplied with filtered air at a rate of 12-13 room volumes/h.

Designed as an external gamma irradiation facility for chronic or long-term exposures, it has 3 irradiation rooms equipped with sealed Cesium 137 as gamma ray sources: 74 (20 mGy/d), 3.7 (1 mGy/d) and 0.185 GBq (0.05 mGy/d, world's lowest dose rate). These dose rates were selected in an attempt to simulate the chronic low dose rate exposure conditions of nuclear power plant workers for the entire duration of their career.

Mice are exposed to radiation continuously for 22 h/day, from 12:00 to 10:00 h the following day. The remaining 2 hours from 10:00 to 12:00 h are used to conduct animal husbandry procedures (change cages, supply food and water) and monitor the health of the mice. The radiation source is located in the centre of the room and the mouse cages are placed on shelves arranged around it. Each irradiation room has a maximum capacity of 300 mice each, i.e. a total of 900 mice can be irradiated simultaneously. The LERF also has 4 animal rooms that can house a total of 3,200 mice at any one time, with total capacity at LERF for a little over 4,000 mice.

A life span study consisting of 4,000 mice was conducted in this facility as well as a serial sacrifice study on tumour latency and progression. Aside from collaborative work with local institutions and universities in Japan, two collaborations have been successfully completed with (1) ENEA using Pch1+/+ mice (DoReMi) and with (2) both HMGU and ENEA using ApoE/- mice (PROCARDIO). These projects involved conversion of conventional mice to SPF, their transport from Europe to Japan, long-term low dose-rate irradiation, necropsy and tissue sample collection, as well as shipment of samples back to Europe for analyses.

The IES continues to carry out studies on chronic irradiation exposure at the LERF using various strains of inbred and genetically engineered mice under various conditions, focusing on late biological effects such as life span, neoplastic incidence and non-neoplastic disease, and on transgenerational and in utero exposure effects, as well as mechanistic studies. Selected biological samples from various experiments are stored and are available upon request to joint collaborators.

IES is open to new joint scientific collaborations.


Low Dose Radiation Therapy (LDRT) has been used for the treatment of chronic degenerative joint diseases for more than a century. The success of the treatment has been described in many retrospective studies and pattern of care studies.

The team of the Radiation Immunobiology performing immunophenotyping of whole blood of patients of the IMMO-LDRT01 study.

Today, the affected region is irradiated mostly using orthovoltage techniques (120-220 kV, 10 mA, own filter 4 mm Al; additional filter: 0.1-1mm Cu). A cycle of LDRT consists of six single fractions with a single dose per fraction of 0.5 Gy, delivered over a period of three weeks with an interfractonal radiation-free interval of at least two days. In cases where there is no remission of pain or only partial remission six weeks after the end of the first cycle, a second cycle of radiation can be administered. In most cases, low dose radiation administered locally (targeting only the painful joint) results in significantly reduced pain perception, not only immediately after therapy, but also for a duration of more than 12 months.

Moreover, patients experience enhanced mobility and increased quality of life. Recent pre-clinical work has revealed that local and systemic osteoimmunological mechanisms are triggered by LDRT depending on the basal inflammatory state.

The IMMO-LDRT01 study aims, for the first time, to provide a detailed analysis of the immune status of patients suffering from inflammatory, chronic joint diseases before, during and after LDRT; this will be done on a longitudinal basis. The established and optimised multi-colour flow cytometry-based assay developed for the cohort allows over 30 immune cell subsets to be determined, in addition to their activation status.

The IMMO-LDRT01 study (NCT02653079) is a prospective and observational study which does not influence the standard therapeutic scheme and will provide hints on the effects of LDRT, not only on the local cells in the irradiated area, but also on the systemic inflammatory response. The analyses are conducted before LDRT (day 0), at the end of first round of LDRT (usually at a total dose of 3 Gy), and at month 3 after completion of the therapy. This scheme is repeated if the patient receives additional rounds of LDRT for relapse treatment.

As a primary outcome measure, changes in circulating immune cells and their phenotype are followed up in patients monitored with deep immunophenotyping. As a secondary outcome measure, changes in joint pain are monitored, and patients also retrospectively comment on their pain sensation and quality of life. All patients have to give their informed consent before starting LDRT. In addition, serum and plasma are stored in our quality-controlled in-house biobank at -80°C (500 μl aliquots). The remaining whole blood cells after serum/plasma retrieval are also stored as frozen peripheral blood mononuclear cells (PBMC) for future functional analysis.

More than 12 months.

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The Environmental Radiation Analysis Laboratory (LARA) of the Institute of Energy Technologies (INTE) at the Polytechnic University of Catalonia (UPC) has been working in the field of low-level measurements of radioactivity in environmental samples since 1982. The LARA has been accredited by the Spanish National Accreditation Service (ENAC) under ISO 17025 since June 2002 and is registered in the Directorate General of Food Quality and Agro-Food Industries of the Department of Agriculture, Food and Rural Action of the Government of Catalonia.

The laboratory equipment at LARA includes 3 germanium detectors, 1 low-background liquid scintillation system, 4 silicon detectors, 6 solid scintillation ZnS detectors and 20 low-background proportional detectors. Natural and artificial alpha, beta and gamma emitters are analysed in more than 600 samples every year.

LARA offers an environmental radioactivity control service which enables the measurement of radionuclides in water, air, food, soil, sediments, milk, vegetation and animal tissue samples for customers interested in checking compliance with national legislation or requirements to export products. Moreover, the laboratory develops new radiochemical methodologies for the determination of low levels of radioactivity and contributes to radiological studies in water treatment plants.

LARA collaborates with organisations such as the Spanish Nuclear Safety Council (CSN), as one of the sparse network laboratories, and with the Health Protection Department of the Government of Catalonia, the Service for Coordination of Radioactive Activities (SCAR) of the Industrial Safety Department of the Government of Catalonia where it contributes, for example, to the Environmental Radiological Survey Plan of the Ascó and Vandellós nuclear power stations. The history and extensive experience of this laboratory has generated long-term collaboration agreements (over 30 years) with renowned institutions and companies such as the CSN and Aigües de Barcelona.

The main research activities of the laboratory are linked to the INTE’s Dosimetry, Medical Radiation and Environmental Physics group (DRMA). LARA takes part in investigations on the physical, chemical and meteorological processes responsible for spatial and temporal variations of radionuclide concentrations in the environment, as well as the improvement of radioactivity measurement methods. Some relevant projects include "Study of the problems in determining the gross alpha activity index in drinking water", "Environmental radiological impact of products related to water treatment", "Risk evaluation due to radioactive components" and the FRESA programme for the study of the impact of dust-laden African and stratospheric air masses in the Iberian Peninsula. Further information about research projects, doctoral theses and publications can be found on the INTE website (www.upc.edu/inte).

Related to:
ALLIANCE

Dr Antonia Camacho
Technical Director
antonia.camacho@upc.edu

ID Card:

Analytical platform type: Laboratory equipped with 3 germanium detectors, 1 low-background liquid scintillation detector, 4 silicon detectors, 6 solid scintillation ZnS detectors and 20 proportional detectors. The laboratory carries out low-level radioactivity determination of all types of environmental samples, including water, soil, air particles, milk, vegetation and animal tissue samples for public administrations as well as private companies.

Main techniques proposed:
Gross alpha and beta activities using proportional counters.
Natural and artificial gamma emitter activity by gamma spectrometry.
Activity of $^{238}\text{U}$, $^{232}\text{Th}$, $^{235}\text{U}$, $^{239}\text{Pu}$, $^{236}\text{Th}$, $^{226}\text{Th}$, by alpha spectrometry.

Capacity:
More than 500 assays per year.

Address:
Technical University of Catalonia (UPC)
Institute of Energy Technologies (INTE)
Environmental Radiation Analysis Laboratory (LARA)
Avda. Diagonal, 647. 08028 Barcelona, Spain

Access:
Joint research collaborations, service contracts

Internet link:
https://inte.upc.edu/en/services/laboratories/radiochemical?
set_language=en

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**Future events:**
- **19 May-2 June 2019**
  Measurement techniques used in monitoring of naturally occurring radionuclides. Central Mining Institute, Kато-виче, Poland
  Contact: Boguslaw Michalik
  b.michalik@gig.eu

- **27 May-7 June 2019**
  Modelling radiation effects from initial physical events. University of Pavia, Italy
  Contact: Andrea Ottolenghi
  andrea.ottolenghi@unipv.it

- **24 June-5 July 2019**
  ADORE - Application of cytogenetic and EPR/OSL techniques for biological dosimetry and physical retrospective dosimetry. Bundesamt für Strahlenschutz, Germany
  Contact: Ulrike Kulka
  ukulka@bfs.de

- **24 June-5 July 2019**
  Space summer school. SCK•CEN, Mol, Belgium
  Contact: Marjan Moreels
  marjan.moreels@sckcen.be
  Bjorn Baselet
  bbaselet@sckcen.be

- **9-10 September 2019**
  CONFIDENCE WORKSHOP: Do Process-Based Models have a role in human food chain assessments? CIEMAT, Madrid, Spain
  Contact: Lindis Skipperud
  Lindis.skipperud@nmbu.no

**Editorial Committee:** Maria Panagiotopoulou, Jean-Michel Dolo, Elisabeth May, Laure Sabatier
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**Future events:**

**Other Events**

- **13-16 May 2019**
  - ConRad 2019, Munich, Germany
  - Confidence training course
  - Use of uncertain information by decision makers at the various levels within the decision making process and its Communication, VUJE, Trnava, Slovak Republic
  - **27-31 May 2019**
    - ICDA-3: 3rd International Conference on Dosimetry, Lisbon, Portugal
  - **10-14 June 2019**
    - Seventh International Conference on Radiation in Various Fields of Research (RAD 2019), Herceg Novi, Montenegro
  - **1-3 July 2019**
    - RICOMET 2019, Barcelona, Spain
  - **25-29 August 2019**
    - ICR 2019: 19th International Congress of Radiation Research, Manchester, UK
  - **8-13 September 2019**
    - ENVIRA 2019: 5th International Conference on Environmental Radioactivity, Prague, Czech Republic
  - **11-13 September 2019**
    - ENGAGE final project workshop: Enhancing stakeholder participation in the governance of radiological risks for improved radiation protection and informed decision making, Bratislava, Slovak Republic
  - **16-20 September 2019**
    - RADECS 2019: Radiation and its Effects on Components and Systems, Montpellier, France
  - **26-29 November 2019**
    - 19th EAN WORKSHOP jointly organised with the PODIUM project: Innovative ALARA tools, Athens, Greece

**12-14 November 2019**

- TERRITORIES final event,
  - Aix en Provence, France
  - Open to TERRITORIES scientists and stakeholders
  - Pre-register your interest here

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- Vasiliki Tafili
vasiliki.tafili@eeae.gr

**Registration here**

**Editorial Committee:** Maria Panagiotopoulou, Jean-Michel Dolo, Elisabeth May, Laure Sabatier