

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 of 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 in-

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

- volving” 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:

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ENA executive board: board@ena-norm.eu
ENA secretary: secretary@ena-norm.eu



Future events:

Call for Travel Grants
Next deadline: 30th June
[Information](#)

14-18 October
[ERPW 2019](#)
Stockholm, Sweden
14th October: MB & ExB/ESAB

WP 6 News:

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!

AIR²D²:
- Please complete the online [form\(s\)](#) to register your infrastructure(s) in the database.

Follow [STORE](#) on Twitter:
[@STOREDatabase](#)

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June 2019



Exposure platforms

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.



Photo: IES

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 $23\pm 2^\circ\text{C}$ with $50\pm 10\%$ 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 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 Ptch1+/- 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.



Photo: IES

Dr Ignacia Tanaka



ID Card:

Exposure type:
External

Source:
Cesium 137

Dose rate:
0.05, 1.0 and 20 mGy/day

Irradiation type:
Gamma

Irradiated organism type:
Rodents (mainly mice)

Address:
Institute for Environmental Sciences (IES)
1-7 Ienomae, Obuchi,
Rokkasho, Aomori 039-3212
Japan

Access:
Joint collaboration only

Supporting lab:
SPF Animal Facility, Microbiology
and Pathology Laboratories

Internet link:
http://www.ies.or.jp/index_e.html

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Photo: IES LERF

Low-dose radiation Effects Research Facility (LERF)

IMMO-LDRT01 cohort

Cohort of locally low-dose irradiated patients with chronic degenerative, inflammatory joint diseases

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.

gitudinal 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.



Photo: Universitätsklinikum Erlangen

Prof. Dr. Udo Gaipl

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.



Photo: M. Rabenstein/Universitätsklinikum Erlangen

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 interfractional 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 lon-

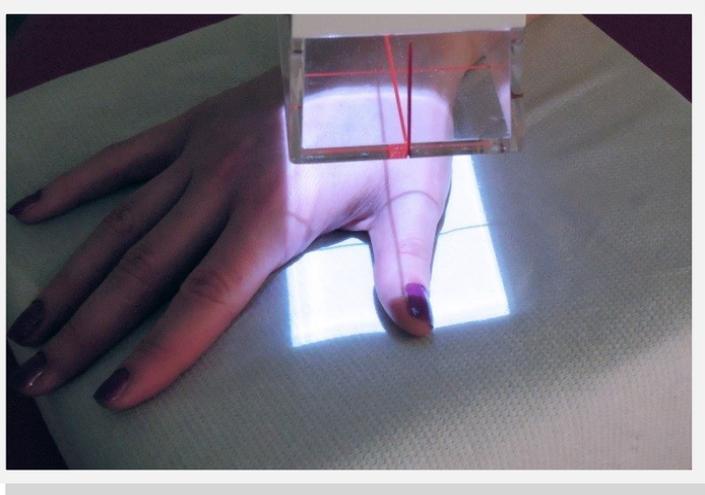


Photo: B. Frey/Universitätsklinikum Erlangen

Irradiation of joints with orthovoltage X-rays.

Universitätsklinikum
Erlangen



ID Card:

Cohort type:

Liquid biopsies of patients with benign diseases after LDRT

LDRT: irradiated using orthovoltage techniques (120-220 kV, 10 mA, own filter 4 mm Al; additional filter: 0.1-1mm Cu); 6x0.5Gy that can be repeated once

Age:

- at exposure: at least 18 years old
- current age: >18 years old

Biobank available:

Yes

Sample type:

Serum, plasma and frozen PBMC

Sample storage conditions:

-80°C

Conditions of use:

Mainly restricted to internal use. External use possible upon submission of a request with project plan

Access:

Selection committee

Internet link:

<https://clinicaltrials.gov/ct2/show/NCT02653079>

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Related to:

MELODI



Radiochemical and Radioactive Analysis Laboratory (INTE-UPC) Environmental radioactivity analyses

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.



Photo: INTE-UPC

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.



Photo: INTE-UPC

Dr Antonia Camacho

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).

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



Photo: INTE-UPC

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}U , ^{234}U , ^{235}U , ^{210}Po , ^{230}Th , ^{232}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

Contact:

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Related to:

ALLIANCE

Future events:

CONCERT Short Courses

19 May-2 June 2019

Measurement techniques used in monitoring of naturally occurring radionuclides. Central Mining Institute, Katowice, Poland

Contact:

Boguslav Michalik
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27 May-7 June 2019

Modelling radiation effects from initial physical events. University of Pavia, Italy

Contact:

Andrea Ottolenghi
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24 June-5 July 2019

ADORE - Application of cytogenetic and EPR/OSL techniques for biological dosimetry and physical retrospective dosimetry. Bundesamt für Strahlenschutz, Germany

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24 June-5 July 2019

Space summer school. SCK•CEN, Mol, Belgium

Contact:

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Bjorn Baselet

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9-10 September 2019

CONFIDENCE WORKSHOP: Do Process-Based Models have a role in human food chain assessments? CIEMAT, Madrid, Spain

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See also on CONCERT website

Issue	Exposure platforms	Databases, Sample banks, Cohorts	Analytical platforms, Models & Tools
Published to date:			
Oct 2015, #1	FIGARO	FREDERICA	RENEB
Nov 2015, #2	B3, Animal Contamination Facility	The Wismut Cohort and Biobank	The Hungarian Genomics Research Network
Dec 2015, #3	Pulex Cosmic Silence	STORE	METABOHUB
Feb 2016, #4	SNAKE	French Haemangioma Cohort and Biobank	Dose Estimate, CABAS, NETA
Mar 2016, #5	Radon exposure chamber	3-Generations exposure study	PROFI
Apr 2016, #6	Biological Irradiation Facility	Wildlife TransferDatabase	Radiobiology and immunology platform (CTU-FBME)
May 2016, #7	CIRIL	Portuguese Tinea Capitis Cohort	LDRadStatsNet
Jun 2016, #8	Mixed alpha and X-ray exposure facility	Elfe Cohort	ERICA Tool
Jul 2016, #9	SCRS-GIG	RES³T	CROM-8
Sep 2016, #10	Facility radionuclides availability, transfer and migration	INWORKS cohort	France Génomique
Oct 2016 #11	LIBIS gamma low dose rate facility ISS	JANUS	Transcriptomics platform SCKCEN
Nov 2016, #12	Microtron laboratory	EPI-CT Scan cohort	CATI
Dec 2016, #13	Nanoparticle Inhalation Facility	UEF Biobanking	The Analytical Platform of the PREPARE project
Feb 2017, #14	Infrastructure for retrospective radon & thoron dosimetry	Chernobyl Tissue Bank	HZDR Radioanalytical Laboratories
Special Issue 1	1st CONCERT Call: CONFIDENCE, LDensRad, TERRITORIES	1st CONCERT Call: CONFIDENCE, LDensRad, TERRITORIES	1st CONCERT Call: CONFIDENCE, LDensRad, TERRITORIES
Mar 2017, #15	Alpha Particles Irradiator Calibration Laboratory at KIT		SYMBIOSE
Apr 2017, #16	Changing Dose rate (SU) Low dose rate (SU)		Advanced Technologies Network Center
May 2017, #17	Chernobyl Exclusion Zone	Chernobyl clean-up workers from Latvia	BfS whole and partial body Counting
Jun 2017, #18	MELAF	Belgian Soil Collection	INFRAFONTIER
Jul 2017, #19	MICADO'LAB	Estchern Cohort	ECORITME
Sep 2017, #20	DOS NDS		CERES

Future events:

Other Events

13-16 May 2019

[ConRad 2019](#), Munich, Germany

13-16 May 2019

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

[ICRR 2019: 16th 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
Registration [here](#)

Contact:

Tatiana Duranova
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16-20 September 2019

[RADECS 2019: Radiation and its Effects on Components and Systems](#), Montpellier, France

12-14 November 2019

TERRITORIES final event, Aix en Provence, France
Open to TERRITORIES scientists and stakeholders
Pre-register your interest [here](#)

26-29 November 2019

[19th EAN WORKSHOP jointly organised with the PODIUM project:](#)

[Innovative ALARA tools](#), Athens, Greece

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Issue	Exposure platforms	Databases, Sample banks, Cohorts	Analytical platforms, Models & Tools
Published to date:			
Oct 2017, #21	CALLAB Radon Calibration Laboratory		CORIF
Nov 2017, #22	Calibration and Dosimetry Laboratory (INTE-UPC)	German airline crew cohort	Centre for Omic Sciences (COS)
Dec 2017, #23	NMG	Techa River Cohort (TRC)	iGE3
Special Issue 2	MEDIRAD	MEDIRAD	MEDIRAD
Feb 2018, #24	UNIPI-AmBe	Greek interventional cardiologists cohort	SNAP
Special Issue 3	2nd CONCERT Call: LEU-TRACK, PODIUM, SEPARATE, VERIDIC, ENGAGE, SHAMISEN-SINGS	2nd CONCERT Call: LEU-TRACK, PODIUM, SEPARATE, VERIDIC, ENGAGE, SHAMISEN-SINGS	2nd CONCERT Call: LEU-TRACK, PODIUM, SEPARATE, VERIDIC, ENGAGE, SHAMISEN-SINGS
Mar 2018, #25	IRRAD	MARiS	BIANCA
Apr 2018, #26	Forest observatory site in Yamakiya	BBM	OEDIPE
May 2018, #27	Belgian NORM Observatory Site	The German Thorotrast Cohort Study	VIB Proteomics Core
Jun 2018, #28	CERF	Mayak PA worker cohort	Geant4-DNA
Jul 2018, #29	TIFPA	RHRTR	D-DAT
Sep 2018, #30	HIT	The TRACY cohort	COOLER
Oct 2018, #31	PTB Microbeam	The BRIDE platform	BRENDA
Nov 2018, #32	AGOR Facility at KVI-CART LNK		MARS beamline at SOLEIL
Dec 2018, #33	PARISII	The ISIBELa cohort	CIEMAT WBC
Feb 2019, #34	The MIRCOM microbeam	The ISE cohort	EFFTRAN
Special Issue 4	NSRL	LSAH & LSDA	GeneLab
Mar 2019, #35	IRSE Experimental Farm	The MWF database	DSA Environmental Laboratory
Apr 2019, #36	PG stack at Barreiro, Portugal	CONSTANCES	The MCDA Tool
May 2019, #37	LERF	IMMO-LDRT01 cohort	Radiochemical and Radioactive Analysis Laboratory (INTE-UPC)