



## **SUPPORT AND INTEGRATION OF EDUCATION AND TRAINING FOR RADIATION PROTECTION RESEARCH IN THE EUROPEAN JOINT PROGRAMME CONCERT**

V. Smyth<sup>1</sup>, A. Ottolenghi<sup>1</sup>, A. Wojcik<sup>2</sup>, G. Safrany<sup>3</sup>,  
M. Coeck<sup>4</sup>, M. Atkinson<sup>5</sup>

<sup>1</sup>Physics Department, University of Pavia, Italy

<sup>2</sup>Stockholm University, Sweden

<sup>3</sup>National Research Institute for Radiobiology and Radiohygiene, Hungary

<sup>4</sup>SCK-CEN Belgian Nuclear Research Centre, Belgium

<sup>5</sup>Helmholtz Centre Munich, Germany

# E&T to support research

- Europe-wide problem with the maintenance of the range of expertise essential to keep up competence for research into the risks to humans and the environment from low-dose radiation.
- Low levels of radiation exposure of concern for radiation protection, risks are obscured by the noise in natural occurrence rates.
- Studies required over many years, even decades, using a wide range of scientific disciplines.
- Management and stewardship required to ensure continuity and cross-fertilisation of all the necessary disciplines.
- Strategic programme of education and training specifically designed to ensure:
  - A continuing influx of new top-level students into the needed scientific areas
  - Continuing professional development of researchers
  - Awareness and understanding of related disciplines
  - Awareness and access to major European radiation, biology, and data processing infrastructures.

# Background to CONCERT

- “High Level Expert Group” ([www.hleg.de](http://www.hleg.de)) in 2009 recommended formation of a European research platform MELODI (Multidisciplinary European Low Dose Initiative)
- EC FP7 Euratom funded a “Network of Excellence” (DoReMi) which ran from 2010 to 2015 to help set up MELODI and issue calls for collaborative research projects on low-dose radiation risk.
- DoReMi began promoting training and education in support of the research programme within the NOE, and also making more widely available training opportunities in order to help attract top-level students into the field.
- The experience gained from DoReMi was carried over into European Joint Programme CONCERT, which will run from 2015 to 2020. The scope of CONCERT has expanded from DoReMi in that it incorporates not only MELODI, but 4 other radiation protection platforms.

# CONCERT European Joint Programme 2015 - 2020



- Funded by Euratom/Horizon 2020
- Umbrella structure for radiation protection research in Europe
- Co-funding action (69% - 31%)
- Open research calls
- Integrative activities (E&T, infrastructures)
- Joint programming with radiation protection platforms:
  - MELODI – low dose risk research
  - ALLIANCE – radioecology
  - NERIS - preparedness for nuclear and radiological emergency response and recovery
  - EURADOS – radiation dosimetry
  - EURAMED – medical use of radiation
  - Social Sciences and Humanities

## **CONCERT Workpackage 7: Education and Training**

### ***From the contract:***

“To respond to the challenge of developing and maintaining new competence, there is a need for **support of E&T in the sciences underpinning radiation protection** in general, and in particular specific research areas such as the hazards from low-dose radiation, medical applications of ionising radiation, radioecology, emergency and recovery management and dosimetry.

CONCERT will provide a Programme of E&T support **consistent with the priorities identified in strategic research agendas** developed as part of the Programme.”

### ***Note:***

**CONCERT supports E&T for research rather than operational radiation protection**

# Task 7.1 – Attracting and retaining students and junior scientists into the Radiation Protection research fields



## Subtask 7.1.1

Travel grants are offered to students and young scientists to attend conferences, courses, or other institutions for study.

Awarded on a competitive basis, consideration given to the merit of the proposal and the potential benefit for the student

16 granted per year, €625 max each.

Details: [http://www.concert-h2020.eu/en/Calls/Call\\_travel\\_grants](http://www.concert-h2020.eu/en/Calls/Call_travel_grants)

## Subtask 7.1.2

Increasing transferability within the EU states will be investigated, in order to facilitate cross-crediting university course modules (such as the MScs in Radiobiology and Radioecology), and work towards full mutual recognition of pre-requisites and degrees.

Dialogue with institutions involved will be maintained through a regular forum coordinated by this task.

## **Task 7.2: Education and training as an essential part of dissemination and knowledge management within CONCERT**

E&T is promoted as an integral part of all funded RTD research projects. Proposals are encouraged to include provision for:

- PhD thesis work; where possible students from new member states shall be encouraged to qualify for PhD Programmes.
- MSc project work; project partners will be encouraged to liaise with universities offering MSc Programmes in scientific disciplines required for radiation protection research to provide supervised projects.
- Offering short courses (1-3 weeks) or teaching seminars on the new science/technology being used or developed (in collaboration with Task 7.3) Courses, seminars, and student opportunities within the RTD projects will be coordinated by this task and promoted through the EJP website.

## Task 7.3: Targeted E&T initiatives

- An annual open call is held for institutions to organise short courses (up to 3 weeks length), summer schools, or teaching seminars on topics of relevance to research into radiation protection.
- Short courses are at the MSc /PhD level.
- Grants are made on the basis of direct costs (travel, subsistence, consumables).
- Generally free to students (including accommodation)
- Three calls held to date
- 36 courses supported

Details [http://www.concert-h2020.eu/en/Calls/ET\\_Call\\_2017](http://www.concert-h2020.eu/en/Calls/ET_Call_2017)



## Course topics include:

- Interdisciplinary radiation research
- Low dose cellular effects
- Emergency response and preparedness
- Genetic and developmental effects of radiation
- Modelling of initial radiation effects
- Molecular mechanisms of radiation carcinogenesis
- Uncertainty analysis
- Radiation epidemiology and dosimetry
- Basic science of radiation protection
- Long-term risks from environmental releases
- Biological dosimetry and retrospective dosimetry
- Uncertainty analysis in low-dose epidemiology

## **Task 7.4: Coordination and collaboration on E&T policy and strategy**

- Inclusion of the interests and requirements of E&T Working Groups of all radiation protection research platforms involved in the EJP (MELODI, ALLIANCE, NERIS, EURADOS, EURAMED and Social Sciences and Humanities)
- Dialogue with other interest groups and stakeholders in order to take account of common policies, resources, and funding streams
- Session on E&T for radiation protection research in the annual MELODI/Radiation Protection Week meetings
  - Munich 2015
  - Oxford 2016
  - Paris 2017 (<http://www.icrp-erpw2017.com/>)

## Task 7.5: European integration of junior scientist career development

- **Subtask 7.5.1** Initiate and encourage interaction between CONCERT, the platforms and the EURAYS association of junior radiation research scientists.
- **Subtask 7.5.2** Establish a cross-border network of mentoring for junior scientists based on a selection and mentor-mentee matching Programme.
- **Subtask 7.5.3** Conduct career days for junior scientists during CONCERT meetings, to include meetings with senior scientists, job fair, career advice and networking.
- **Subtask 7.5.4** Hold “Meet the Professor” lunches during international conferences held in Europe (including the IRPA, ERR, ICRR, MELODI and DoReMi meetings), to allow junior scientists contact with leaders in the community from academia and stakeholders, regulators and policy makers.
- **Subtask 7.5.5** Establish the NEWS network to facilitate dialogue between junior faculty members in new and established member states.

## The E&T priorities of the participating Radiation Protection Platforms

### **MELODI** ([www.melodi-online.eu](http://www.melodi-online.eu))

Platform for research into the risks from levels of ionising radiation in the region where it is still unclear whether the linear no-threshold model applies.

- Interest areas are the basic mechanisms of biological response to radiation, health risk evaluation, impact of radiation exposure characteristics, and individual sensitivities
- Attraction of students into the application of radiation research in disciplines of biology, physics, epidemiology, mathematics and statistics
- Development of interest in new fields of application such as systems radiation biology, bioinformatics, computer simulation of radiation interaction with biological systems

## **ALLIANCE** ([www.er-alliance.org](http://www.er-alliance.org))

Platform for the study of the behaviour and effects of radioactive elements in the environment and the exposure of humans and other organisms to radiation. Areas of interest are:

- Knowledge about the behaviour of radionuclides in the environment
- Application of radiobiology methods and biomarkers in ecological research
- Effects and endpoints significant for non-human organisms,
- Factors influencing radiosensitivity in different organisms, and ecological risk assessment.
- Radiochemistry, impact and risk assessment, the nuclear industry and waste management

**NERIS** ([www.eu-neris.net](http://www.eu-neris.net))



Platform on preparedness for nuclear and radiological emergency response and recovery. Areas of interest are:

- state of the art in nuclear and radiological emergency management
- principles of intervention
- radiological evaluations
- decision-support tools
- different aspects of planning and organization in off-site emergency response
- economic, social and psychological impact
- recovery of living conditions in contaminated areas in the aftermath of a nuclear/radiological accident
- modelling the long-term radiological risks from releases to the environment of radionuclides

## **EURADOS** ([www.eurados.org](http://www.eurados.org))

Platform for promoting research and development and European cooperation in the field of the dosimetry of ionizing radiation.

Areas of interest:

- Individual monitoring for external and internal exposure
- Retrospective dosimetry
- Environmental radiation monitoring
- Diagnostic and interventional radiology
- Nuclear medicine
- Radiation therapy
- Computational dosimetry

EURADOS E&T activities :

- Workshops and training courses sponsored by EURADOS in the field of radiation dosimetry and implementation of technical recommendations and/or good practice in dosimetry
- Winterschool: a one-day refresher course held in conjunction with the EURADOS Annual Meeting
- Grant & Award: for young scientists within the activities of EURADOS Working Groups; grant support for research stay of young scientists.

## **EURAMED**

[www.eibir.org/scientific-activities/joint-initiatives/european-alliance-for-medical-radiation-protection-research-euramed](http://www.eibir.org/scientific-activities/joint-initiatives/european-alliance-for-medical-radiation-protection-research-euramed)

Platform for coordinating radiation protection research in the medical application of ionising radiation.

Made up of the five medical societies:

- European Association of Nuclear Medicine, EANM;
- European Federation of Organizations for Medical Physics, EFOMP;
- European Federation of Radiographer Societies, EFRS;
- European Society of Radiology, ESR;
- European Society for Radiotherapy and Oncology, ESTRO

Areas where supportive E&T is needed:

- Education of staff to gain greater awareness and competence in dealing with radiation protection issues
- Education of researchers. Particularly:
  - Aspects of research methodology particularly required in medical research
  - Especially for research working with humans or biological material, and any data related to humans.



## Social sciences and humanities

- The SSH do not have a platform dedicated to radiation protection, but there are activities in CONCERT that explicitly engage expertise in this area.
- Input and comments from the SSH are actively encouraged in Workpackage 2 where the platform Strategic Research Agendas are developed and research priorities identified.
- Also, Workpackage 5 is concerned with development of dialogue with stakeholders, and this is an area where topics such as risk perception and the ethics of accepting risk as part of the use of radiation must be considered.
- There is a provision for courses in this area within CONCERT Task 7.3. One of the suggested course topics is “Risk governance and stakeholder dialogue”.

## End note

- Currently there is an EC commitment to supporting E&T
- “Research **and Training** Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 Framework Programme for Research and Innovation”
- There is an understanding of the need to support and build expertise through E&T
- CONCERT runs until May 2020 and will support E&T until then
- Something else will surely follow . . .



Thank you to members of  
DoReMi  
OPERRA, and  
CONCERT  
For supporting E&T

*Thank you for listening!*