How can the European Radiation Dosimetry Group (EURADOS) contribute to research in low doses?

Fabiene Paola; Ainsbury Liz; Burbidge Christopher; Chumak Vadim; Romm Horst; Rothkamm Kai; Trompier Francois; Woda Clemens; Bajenskis Ainars; Barquinero J. Francisco; Bassinet Celine; Bernhardsson Christian; Cauwels Vanessa; Correcher Virgilio; Della Monaca Sara; Ekendahl Daniela; Greigoire Eric; Hole Eli Olaug; Jaworska Alicja; Kournoukla Efthychia; Kulka Ulrike; Marrade Maurizio; Maznyk Natalie; Michaela Barbara; Monteiro Gil Octávia; Moquet Jayne; Oestreicher Ursula; Pacif Jelena; Testa Antonella; Veronese Ivan; Vinnikov Vinn; Voisin Philippe; Wieser Albrecht; Wójcik Andrzej

1. ISS, Italy
2. HPA, United Kingdom
3. IST/ITN, Portugal
4. Expertise in Increasing the throughput of samples by Research into mechanisms of chromosome HPA, United Kingdom
5. Validation of consolidated (bio)markers of Sophisticated data analysis methods for dose and Provision of (chromosome) dosimetry for European Radiation Dosimetry Group e.V.
6. H2AX as a low dose detector of ionizing radiation exposure suitable over a wide dose range, both for epidemiological studies and emergency situations
7. Past experiences of WG10 members in research at low doses
   - Participation in epidemiological studies on health effects and low dose exposure, especially retrospective cohort studies (Mayak workers, Southern Urals residents, Chernobyl liquidators) with:
     - EPR dosimetry with tooth enamel
     - FISH for stable translocations detection
     - TL/OSL dosimetry with building materials
   - Establishment of gamma-H2AX as a low dose exposure biomarker in diagnostic radiology
   - Research into mechanisms of chromosome aberration formation
   - Provision of (chromosome) dosimetry for reassurance purposes in cases of very low dose exposure or suspected exposure
   - Sophisticated data analysis methods for dose and uncertainty estimation

References

Introduction

A EURADOS network of biological and physical dosimetry laboratories was created in 2009 (WG10).

Aims: To develop a multidisciplinary approach towards retrospective dosimetry; To implement/validate novel methods/approaches of retrospective dosimetry and of (bio)markers of exposure; To disseminate scientific knowledge.

Description of Task Groups

WG10 has reviewed properties and drawbacks of retrospective dosimetry methods and of markers of exposure suitable over a wide dose range, both for epidemiological studies and emergency situations. Based on this work, relevant needs in the field were identified and related task groups were created.

Identified needs

<table>
<thead>
<tr>
<th>Identified needs</th>
<th>Short term aims of WG10 TGs</th>
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<tbody>
<tr>
<td>Integrated approach to uncertainty</td>
<td>To identify best practice and harmonise uncertainty analysis among the various methods (TG6)</td>
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<td>Determination of exposure to internal emitters</td>
<td>To examine the usefulness and limitations of biological dosimetry in internal and mixed internal/external exposures (TG7 – in collaboration with EURADOS WG7)</td>
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<td>Training</td>
<td>To train young scientists in physical and biological assays for retrospective dose assessment. 1st EURADOS School on Retrospective Dosimetry (Neuberberg, Germany, 22-26 October 2012) (TG3)</td>
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<td>Development of novel physical retrospective dosimetry methods</td>
<td>To validate and disseminate the use of Electron Paramagnetic Resonance/Optically Stimulated Luminescence (EPR/OSL) retrospective dosimetry with mobile electronic devices through intercomparison within the EURADOS network (TG4)</td>
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Past experiences of WG10 members in research at low doses

- Participation in epidemiological studies on health effects and low dose exposure, especially retrospective cohort studies (Mayak workers, Southern Urals residents, Chernobyl liquidators) with:
  - EPR dosimetry with tooth enamel
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- Sophisticated data analysis methods for dose and uncertainty estimation

How can WG10 contribute to research at low doses?

WG10 can contribute with:
- Development of novel (bio)markers of ionizing radiation exposure
- Validation of consolidated (bio)markers of exposure at low doses
- Increasing the throughput of samples by improvement and automation of the methods
- Expertise in participation in classical and molecular epidemiological studies
- Verification of the applicability of multiparametric dosimetry techniques at low doses
- Harmonisation of and training in retrospective dosimetry methods
- Expertise in dosimetric and radiobiological data analysis