

# How can the Network on Retrospective Dosimetry contribute to research in low doses?

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## 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<sup>1</sup>. Based on this work, relevant needs in the field were identified and related task groups were created.

Identified needs	Short term aims of WG10 TGs
Integrated approach to uncertainty	To identify best practice and harmonise uncertainty analysis among the various methods (TG6)
Determination of exposure to internal emitters	To examine the usefulness and limitations of biological dosimetry in internal and mixed internal/external exposures (TG7 – in collaboration with EURADOS WG7)
Training	To train young scientists in physical and biological assays for retrospective dose assessment. 1st Eurados School on Retrospective Dosimetry (Neuherberg, Germany, 22-26 October 2012) (TG3)
Development of novel physical retrospective dosimetry methods	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)

## Past experiences of WG10 members in research at low doses

- ✓ Participation into 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

## 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

## References

<sup>1</sup> Ainsbury EA and 30 co-authors. Review of retrospective dosimetry techniques for external ionizing radiation exposures. Radiat. Prot. Dosim. 2011; 147 (4): 573–592.