

Results of a global inter-laboratory comparison on the cytogenetic and genomic assays in the frame of the European Network of Biodosimetry - RENE B

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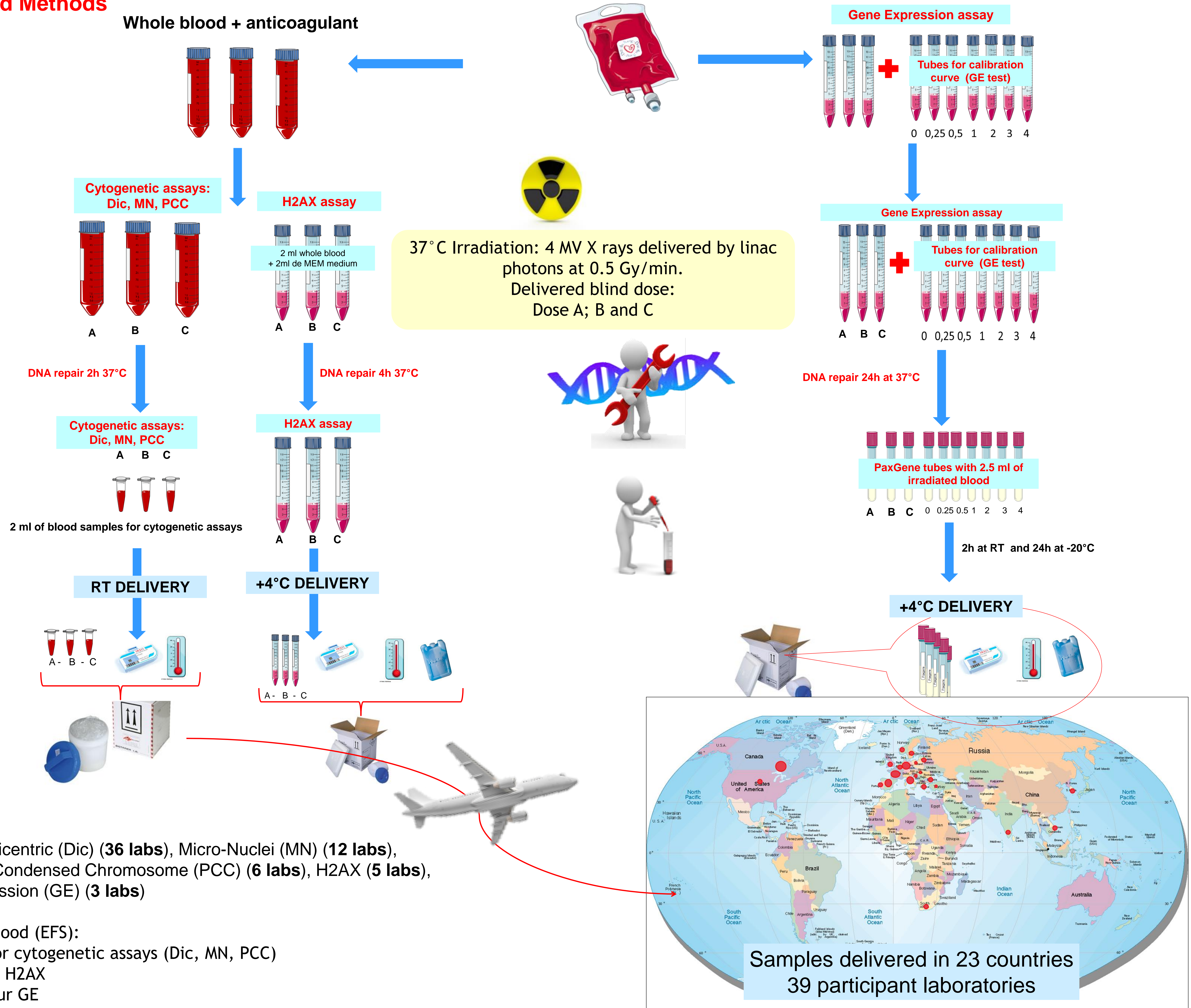
Introduction

Inter-laboratory exercises have been performed within the RENE B project, supported by the European Commission (FP7, GA 295513), and now in the RENE B network to validate biological dosimetry assays (Dicentric chromosome (Dic), Micro-Nuclei (MN), Premature Condensed Chromosome (PCC), Gamma-H2AX and Gene Expression), in case of large scale radiation accidents. For this purpose, all assays have been adapted to handle a large number of samples. Therefore all of the precedent inter-comparisons have been performed in the triage mode, meaning scoring minimal number of cells.

This is the first time that the inter-laboratory comparison (ILC) was done for estimating a precise dose based on a higher number of cells.

For this exercise, 21 biodosimetry laboratories from 13 European countries participating in the RENE B network were involved. Moreover 15 additional biodosimetry laboratories from 10 countries outside of the European Community joined this exercise providing the opportunity to compare the results at an extra-European level. In total, 36 laboratories from 23 countries participated in this global exercise using different assays for dose assessment.

Materials and Methods

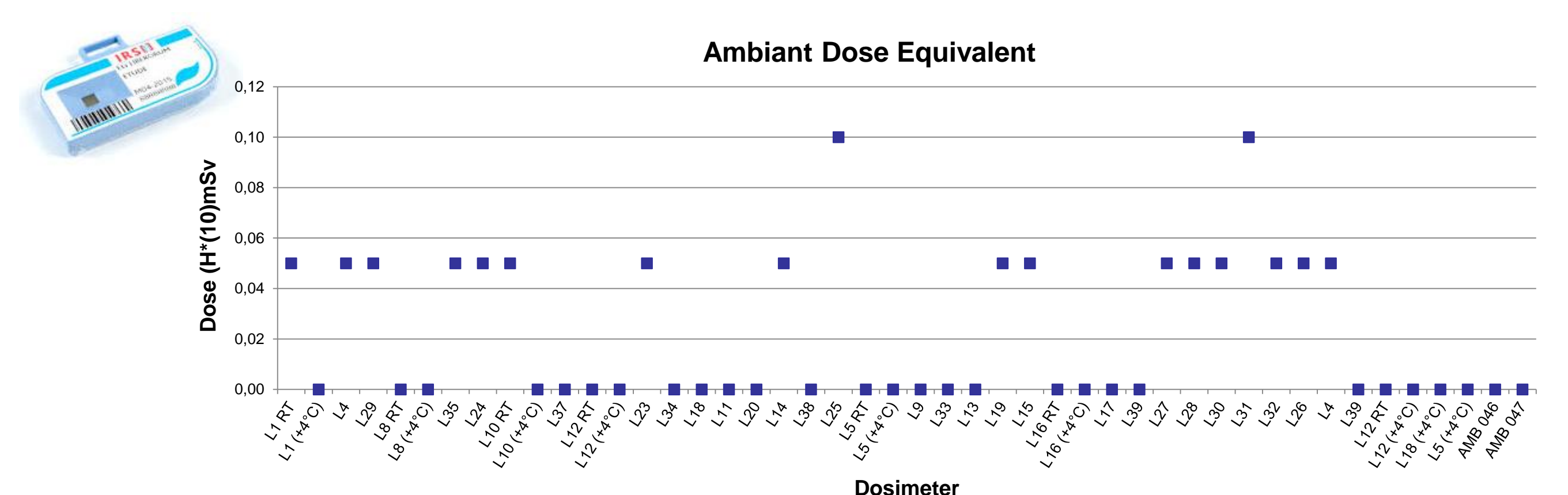


Results

- **Delivery in less than 24h: 7 labs**
- **Delivery in 24h: 23 labs**
- **Delivery on more than 48h: 3 labs**
- **Never delivered: 2 labs**

77% of labs delivered in 48 h. 68% of shipments carried out in 48h.

- Homogenization of GE and H2AX protocol.
- Raw data of each assays in check and analysis
- Chromosome Dicentric assay: At this level, the way to calculate the dose confidence interval appears to be critical. Indeed several ways are available (Methods A, B, C AIEA2001, Methods var/covar AIEA 2011...) and each one can change a lot the result of the ILC (the most recent appear to be the most adequate).



No dose over 0.1 mSv received by the samples during the transport.



Transport at ambient temperature during the transport.

Conclusions

- 77% of labs delivered in 48 h.
- First ILC involving as many participants, in Europe and in Asia, North America and South Africa
- First time that ILC aimed blind precise dose assessment (instead of triage scoring) on 5 different assays.
- Homogenization of the dose assessment and the confidence interval calculation.
- No risk of radiation overexposure of the samples during the flight transport.