Annual Meeting, Rome, March, 2015-03-16.

Comments from the Advisory Board.

The Advisory Board is very pleased with the progress to date. All activities due by this point in the programme have been achieved with reports and deliverables produced on time.

One of the main activities since the previous Annual Meeting was the completion of a large intercomparison exercise and the Board was pleased to note that besides the broad scale and successful contribution of the RENEB laboratories an invitation had been made also for non-EU laboratories to participate. There had been a good take-up of the offer and several interesting lessons were learned. Firstly, while there was no problem in transporting blood specimens between EU countries there were some serious difficulties outside Europe and in some cases it proved impossible for a few states to participate even with imported slides rather than blood. This was a salutary lesson that may have implications for dealing with a major radiological event that might extend beyond a single continent.

For the various assays employed in the exercise we were pleased to see that the degree of agreement was good, especially among the RENEB members, and we were interested to learn that there was a small but distinct tendency for laboratories to slightly overestimate the doses. However the degree of overestimation was not serious enough to compromise or mislead any clinical uses to which the biodosimetry results would be put. As expected, there were a few outlier results but they were sporadic and one could not point to any particular laboratory or assay. The Board was interested to hear the opinion from several RENEB members that some diversity between laboratories could be due to different blood transport times and in-transit conditions, as well as the inevitable small differences in processing the blood samples. This certainly was borne out by a very interesting presentation where, using the dicentric plus centromeric and telomeric probes assay, a gallery of captured images had been circulated to RENEB laboratories. This therefore by-passed the possible factors mentioned above for causing some variability, and we were pleased to see that the scoring results showed a really tight level of agreement. This points to the potential value of undertaking telescoring between network partners in the event of a major incident and we note that among the RENEB members there is already a good level of experience with telescoring. Telescoring however needs a good working platform and the answer may lie in the EU's STORE initiative- see below.

We were pleased that one puzzling problem that arose from the earlier first intercomparison had been resolved. This concerned one serious outlier result with the semi-automated micronucleus assay. The task leader and the outlier laboratory had investigated further and shown convincingly that this was due to the fixed bi-nucleate cell preparations having been stored in a freezer rather than slides being made immediately. This was a very useful technical detail that should be disseminated across the biodosimetry community. One more general interesting finding from the micronucleus assay is that the semi-automated scoring version of the assay is best and should be the method adopted by the network if it is decided to use micronuclei when dealing with an emergency.

The Board was pleased that the intercomparison had shown that the semi-automated micronucleus assay was shown to usefully fill the time gap between blood sampling and the results of the dicentric assay becoming available. Likewise the exercise confirmed that H2AX is a valuable assay to use if sampling can be done rapidly within 24h of a major event. Both techniques have been shown by the RENEB activities to be mature assays for deployment in the appropriate situations.

Regarding assays other than the 'traditional' cytogenetic methods, the Board was interested to learn of the conclusion that at present the EPR assay on glass is probably not yet deployable en masse. However very pleasingly it was shown that OSL on selected components of cell phones has excellent low dose sensitivity and the technique can be made easier by omitting a pre-heating step. These are valuable lessons learned.

The Board was impressed by the number of 'candidate' laboratories that had been identified for the eventual expansion of the network. In particular there are a number of laboratories undertaking gene expression assays. It was clear that after 20+ years of research into radiation-induced changes in gene expression the methods were now crystallising into a useful biodosimetry tool. This discipline will certainly need to be incorporated into whatever continuing network emerges after the RENEB programme funding finishes. Clear lessons presented to the meeting were that PCR methods are much cheaper than multi-gene arrays. However array systems could become more targeted to radiation, with commensurate cost savings, because only modest numbers of genes need to be considered. We were told of a panel of 16 genes being informative for evaluating high doses and a panel of 9 genes for low doses. There is a clear need, perhaps after the end of the RENEB programme, for an intercomparison exercise to be undertaken that includes gene expression, EPR and OSL, and possibly Ramen spectroscopy too, and to compare them with the traditional cytogenetic 'gold standard' dicentrics.

The meeting heard a presentation about the STORE project and it was clear that this will be a useful tool for a European biodosimetry network. It will provide a facility for spreadsheet compilation of results during the emergency response. Also it could provide a seemingly limitless capacity platform for image telescoring. The Board noted that the present format of STORE is limited but that in 2016 it will be comprehensively restructured and also transferred to BfS. We strongly urge our BfS RENEB colleagues to engage closely with their STORE colleagues to ensure that the needs of a future biodosimetry network will be incorporated into the restructuring.

The Board was very pleased with the progress made on a RENENB QA Manual. This to some extent compliments the IAEA biodosimetry Manuals (TRS-405, 2001 and EPR-Biodosimetry-2011) and the ISO dicentric, micronucleus and EPR standards. However by extending it to include the newer assays that are not likely to be the subject of ISO documents for many years, the RENEB document will provide a firm foundation for a continuing network.

So what will happen after RENEB formally ceases at the end of 2015? The Board was pleased to note that a future network is being carefully considered and ideas are firming-up in several respects. It is presumed that 2016 will start with a nucleus of labs, initially most but probably not all the present RENEB partners, being linked with a Memorandum of Understanding. These are primarily laboratories that are already recognised by their national competent authorities as being appropriate to represent their countries in the international biodosimetry forum. We are in agreement that this is the preferable and achievable way forward initially, and eventually, over a

number of years, this MoU can evolve into an ERIC agreement that will certainly be necessary for EU recognition. Other outputs for the future have been initiated, such as the QA Manual, and very importantly a Strategic Research Agenda is well advanced. This will be a crucial document to support a reincarnated RENEB wherever it is fitted into existing EU platforms. The Board was pleased to note that plans are well in hand for an end-of-project open workshop. This is an important opportunity for RENEB to 'sell itself' to the decision makers of the European radiological protection community to ensure a continuing reliable, harmonized and operational network of biodosimetry.