



PROCORAD

Radiotoxicological Intercomparison exercises

Annual Meeting Program

June 18-20 2025

SALAMANCA – (Spain)



Reception of participants: Wednesday June 18 2:00 PM

Hôtel ABBA FONSECA

Plaza San Blas, 2

37007 SALAMANCA (SPAIN)

Simultaneous translation: English-French and French-English

**A coffee break, visits to Salamanca and the ENUSA industrial site are
sponsored by ENUSA**

Wednesday 18th june 2025

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|--------------------------|---|
| 2:00 -2 :30 PM | Welcome drink - Distribution of badges and working documents |
| 2:30 PM - 3:15 PM | Reception of participants welcome speech <i>Claude GUICHET, President of PROCORAD</i> <i>Mariano MORENO President of ENUSA</i> |
| 3:15 PM - 3:30 PM | Information on the meeting progress Balance sheet of participation <i>Claude GUICHET, Secretary of PROCORAD</i> |
| 3:30 PM - 3:45 PM | Statistical exploitation of EQA results PROCORAD <i>Philippe CORREZE, ORANO/La Hague/LBM (France)</i> |
| 3:45 PM - 4:15 PM | Uranium in urine <i>Géraldine LECOIX, CEA/Marcoule/LBM (France)</i> |
| 4:15 PM - 5:00 PM | Presentation 1 « Historical evolution of ENUSA in the determination of uranium and its isotopes » <i>David BLAZQUEZ ENUSA (Spain)</i> |
| 5:00 PM - 5:30 PM | Gamma-X emitters in urine <i>Alexandra FAUSSART, CEA/Cadarache/LBM (France)</i> |
| 5:30 PM – 6:00 PM | Alpha emitters on nasal samples <i>Eléonore BERTAUT, CEA/Valduc/LBM (France)</i> |
| 6:00 PM | End of session |
| 6:30 PM | Departure for Salamanca visit |

Thursday 19th june 2025

8:30 AM - 9:15 AM **Carbon 14, Sulfur 35 and Phosphorus 32 in Urine**
Véronique CHAMEL, CEA/Grenoble/LBM (France)

9:15 AM - 10:00 AM **Presentation 2: « A simple method to project and adapt measurement techniques for a mass monitoring of internal contamination in radiological emergencies»**
Paolo BATTISTI ENEA Italy)

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| 10:00 AM - 10:30 AM | Coffee break |
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10:30 AM - 11:00 AM **Actinides in Urine**
Géraldine LECOIX, CEA/Marcoule/LBM (France)

11:00 AM - 11:45 AM **Presentation 3 : « Orano Med : from radiological waste to revolutionary anti-cancer treatment»** *Thomas PRIEM ORANO MED (France)*

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|---------------------------|--------------|
| 12:00 PM - 2:00 PM | Lunch |
|---------------------------|--------------|

2:00 PM - 2:45 PM **Ordinary General Meeting PROCORAD**

- Moral report : *Claude GUICHET, president*
- Financial report : *Philippe CORREZE, treasurer*
- Website : presentation of the website change *Véronique CHAMEL, webmaster and Laurent MEUWLY IT Consultant*
- Quality Management: *Géraldine LECOIX quality manager*
- Miscellaneous questions
- Vote, signature of the summons list

2:45 PM - 3:30 PM **Actinides in fecal ashes**
Philippe CORREZE Orano/La Hague/LBM (France)

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| 3 :30 PM - 4:00 PM | Coffee break |
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4:00 PM - 4:30 PM **Actinides-DTPA in urine**
Géraldine LECOIX, CEA/Marcoule/LBM (France)

4:30 PM - 5:00 PM **Press Review and international calendar**
Nicolas BAGLAN, coordinator of scientific council PROCORAD

5 :00 PM-5 :30 PM **Organically Bound Tritium in wheat**
Nicolas BAGLAN, CEA/Paris Saclay/DES-SIAE (France)

5 :30 PM **End of session**

7 :30 PM **GALA DINNER**

Friday 20th June 2025

9:00 AM - 9:45 AM

Sr-90 in urine

Xavier MILLOT, CEA/Paris Saclay/LBM (France)

9:45 AM - 10:00 AM

Tritium in Urine

Eléonore BERTAUT, CEA/Valduc/LBM (France)

10:00 AM - 10:30 AM

Coffee break

10:30 AM - 11:00 AM

Po-210 in urines

Xavier MILLOT, CEA/Paris Saclay/LBM (France)

11:00 AM - 11:45 AM

Presentation 4 : «The challenge of “new radioisotopes” in nuclear medicine »

Sandrine HUCLIER Subatech (France)

11:45 AM - 12:15 PM

**General Discussion - 2026 Comparison Exercices :
Date, venue, technical specifications**

Claude GUICHET, secretary of PROCORAD

12:15 PM

End of the meeting - Lunch

(2 :00 PM)

(Departure for the visit of the ENUSA production site)

(5 :30 PM)

(Expected return to the ABBA FONSECA Hotel)

| Presentation | | Title | Abstract |
|--------------|----------------------|---|---|
| 1 | David Blasquez-Perez | Historical evolution of ENUSA in the determination of uranium and its isotopes | ENUSA is the national uranium company in Spain. Many years of uranium mining have demanded the need to survey and analyze concentrations in deposits. Currently, the nuclear fuel factory located in Salamanca supplies fuel to Spain and Europe. Their laboratories use various techniques to measure, control and monitor the enriched uranium oxide aerosols concentration in the exposed workers and the potential environmental impact. |
| 2 | Paolo Battisti | A simple method to project and adapt measurement techniques for a mass monitoring of internal contamination in radiological emergencies | <p>"Taking into account the general, often disproportionate perception of radiological risk, one of the most critical aspects in emergencies associated with the release of significant amounts of radioactivity into the environment, is undoubtedly the possibility of radioactive contamination (internal contamination) of the individuals involved, given the heavy psychological impact quite surely it would have on the public, also in the presence of low or even negligible levels of contamination.</p> <p>In this context, the capacity to conduct sufficiently accurate and fast evaluations of exposure levels (internal dose) for each person involved, and thus a reliable quantification of the actual individual risk, should be undoubtedly a fundamental tool to have available for facilitating the social management of the event.</p> <p>In a situation where radiation protection criteria must be substantially adjusted to specific needs, if necessary also adopting reference dose levels significantly higher than those used in standard radiation protection practice, as suggested by ICRP itself, the aforementioned "fastness" is closely related to the capacity to carry out a sufficiently high number of appropriate individual measurements in a short time. Achieving this goal requires not only the involvement of many specialized laboratories but also, and above all, the adoption of measurement techniques specifically designed and validated.</p> <p>From this perspective, while simplified in vivo measurement methodologies (whole-body counting, organ counting) have been extensively tested as suitable and easy-to-use solutions for gamma-emitting radionuclides, internal contamination monitoring for pure alpha and beta emitters is much more complex to address. In most cases, there are in fact no truly alternative methods useful for screening, and standard radiotoxicological analysis procedures for excreta are often too complex, time spending and costly for large-scale implementation. In these cases, the only realistically feasible solution, despite its limitations, is to reconfigure the analysis protocols to seek a compromise between the quality of the result, especially in terms of detection limit level and precision, and the simplification of analytical and sampling techniques. Given the hypothesized conditions (monitoring in a short time a large number of individuals of the public), this approach can only be directed toward analysis of small volume urine samples.</p> <p>The aim of this presentation is just to expose a simple criterion based on the concept of "minimum detectable dose" and developed in order to design useful methods of analyses of small urine samples to be applied whenever a mass internal contamination monitoring is required. It allows for the prior identification of which parameters to "play with" for defining an "as fast as possible" procedure, capable of detecting all contaminations leading to the exceedance of a predetermined effective dose value assumed as a Reference Level, as well as delineating the time interval useful for its application (in this specific case, the time spent between the moment of contamination and urine collection).</p> <p>"</p> |
| 3 | Thomas Priem | Orano Med : from radiological waste to revolutionary anti-cancer treatment. | Orano Med was created from an idea: searching within the Orano group for new applications for materials held which until then had no use and were even considered as waste. In 15 years, Orano Med has been able to propel Pb-212 as one of the most promising radionuclides in targeted alphatherapy for the treatment of patients suffering from cancers for which there is no effective therapeutic solution. But Orano Med has also been able to develop a robust industrial tool to guarantee the global supply of its therapies. If the marketing of its first radiopharmaceutical drug scheduled for 2026 will mark an accomplishment, the first patients treated during clinical trials and cured have already made of this adventure a success. |
| 4 | Sandrine Huclier | The challenge of "new radioisotopes" in nuclear medicine. | This presentation will present the different radionuclides produced in Arronax for Nuclear Medicine. A focus will be given on the 44Ti/44Sc generator as a source of 44gSc for PET imaging. Only a small number of facilities worldwide use these generators. One of the main drawbacks is the half-life of the parent radionuclide 44Ti (t1/2 = 60 y). The high-energy γ-rays (1157 keV, 99.9%) emitted during 44gSc decay can reduce image quality. This involves as well to design specific radiosafety procedures around the generator. Additionally, the utility of Auger radionuclides in therapy represents a great potential due to their very short range and high-multiplicity, high LET-like qualities. The work on 103mRh (t1/2 = 56.11 min) produced from 103Ru will be presented. The most challenging task is to reach an effective separation between the two radionuclides because of the highly unpredictable and very complicated chemistry. |