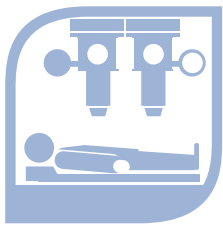


# IRSN

INSTITUT  
DE RADIOPROTECTION  
ET DE SÛRETÉ NUCLÉAIRE



The IRSN offers a whole-body counting service for employees potentially exposed to internal contamination, either at the IRSN's Vésinet site (Yvelines, Paris) within its laboratory, or at the customer's own site with its mobile facility.

## The in vivo measurement service

Certain professional activities require employees to handle unsealed radioactive sources or be present at potentially contaminated sites. This exposure carries a risk of internal contamination of employees by inhalation, ingestion or absorption.

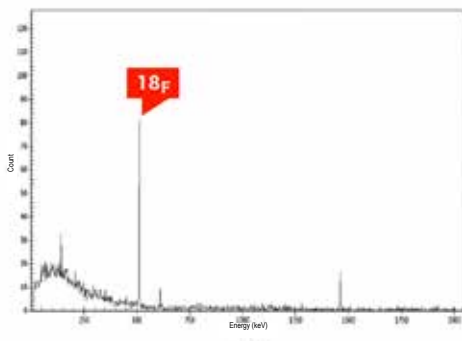
In accordance with the regulations set out in the French Labour Code, any organisation whose staff is subject to a risk of internal contamination by radionuclides must monitor its staff using appropriate means and methods, such as measuring the activity of radioactive materials excreted in urine and/or in vivo monitoring whereby direct measurements are taken.

### In vivo measurement

In vivo measurement involves measuring X-ray and gamma radiation directly emitted outside the body by radionuclides distributed either homogeneously in the whole body or within a specific tissue or organ such as the thyroid or lungs.

#### The main advantages:

- A direct measurement of the retention of radionuclides.
- A non-invasive, fast and instant measurement (compared with measurements taken from faeces and urine, which are much slower as they require prior chemical treatment of the samples).



> **Example of detection** of a fluorine-18 peak at 511 keV on the spectrum of an in vivo measurement (whole-body geometry).

#### Use of the measurements:

1. Detection is carried out using germanium or sodium iodide detectors.
2. The radionuclides present are identified and quantified (in Bq) using the emission spectrum of the count, by comparison with anthropomorphic calibration phantoms.
3. The result provided is the Becquerel activity at time  $t$  of the measurement, which can be used to calculate the effective dose in mSv.

Note: The in vivo measurement report is sent to the occupational health physician.

## The IRSN solution

The IRSN's In Vivo Measurement Laboratory performs fast, reliable and accurate measurements at its facilities. Its service includes:

- ⊕ **A study of your employee monitoring requirements** in terms of frequency of testing and measurement geometry (whole body, thyroid only, etc.), in order to develop an **optimised measurement campaign**.
- ⊕ **The organisation of in vivo measurement campaigns at your site using the mobile facility**, in collaboration with your own services.
- ⊕ **Flexible and rapid planning of in vivo measurements** at the IRSN site in Vésinet (Yvelines), and, in the event of a radiological incident, the immediate management of contaminated persons for measurement and evaluation.
- ⊕ The preparation and delivery of **in vivo measurement reports within one month** and in compliance with current regulations.
- ⊕ Answers to **all your questions** concerning the **interpretation** of your results in consultation with our experts who are at your disposal.

## In vivo measurement of internal contamination



**Whole-body counting mobile facility** (*Laboratoire mobile d'anthroporadiométrie - LMA*).

**Emergency iodine measurement unit (Boxer).**

**In vivo measurement laboratory** at the Vésinet site.



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