# iMERA-Plus JOINT RESEARCH PROJECT PROTOCOL

| | | | |
|---|---|---|---|
| 1. **Reference Number:** ***(please leave blank)*** | 2. **Targeted Programme** ***(Number and short name):*** 2 - Health | | |
| 3. **Proposed start date: 1 January 2008** | **Proposed end date: 31 December 2010** | | **Project Duration (months): 36** |
| 4. **Signed Collaboration agreement:** | **Yes** ☐ **No** ☐ | **Reference Number**: *To be added after contract but before pre funding* | |
| **Signed Guestworker agreement(s):** | **Yes** ☐ **No** ☐ | **Reference Number(s)**: *To be added after contract but before pre funding* | |

5. **Coordinating institute & JRP coordinator contact details:**

Laboratoire National Henri Becquerel, LNE-LNHB, France
Coordinator : Bruno Chauvenet DETECS/LNHB, CEA Saclay, F-91191 Gif-sur-Yvette cedex, France –
tel : +33 1 69088981 – fax : +33 1 69082619 – email: bruno.chauvenet@cea.fr

**Funded partners** *(Institute full name, short name & country)*:

- Bundesamt für Eich- und Vermessungswesen, BEV, Austria
- Centro de Investigaciones Energeticas, Medioambientales y Tecnologicas, CIEMAT-LMRI, Spain
- Czech Metrology Institute – Inspectorate for Ionizing Radiation, CMI-IIR, Czech Republic
- Ente per le Nuove tecnologie l'Energia e l'Ambiente, Instituto Nazionale di Metrologia delle Radiazioni Ionizzanti, INMRI-ENEA, Italia
- Institut universitaire de Radiophysique Appliquée, IRA, Switzerland
- Joint Research Centre, Institute for Reference Materials and Measurements, IRMM, European Commission
- National Institute of R&D for Physics and Nuclear Engineering "Horia Hulubei", IFIN-HH, Romania
- National Physical Laboratory, NPL, United Kingdom
- Physikalisch Technische Bundesanstalt, PTB, Germany
- Slovak Institute of Metrology, SMU, Slovakia

**Co-funding partners i.e. non-funded partners** *(Institute full name, short name & country)*:

- Bureau International des Poids et Mesures, BIPM, France
- PET Centrum BIONT Inc., BIONT, Karloveská 63, 842 29 Bratislava, Slovakia

| **WP No** | **Work Package Name** | **Active Partners** *(WP Leader in Bold)* |
|---|---|---|
| WP1 | JRP Management and Coordination | **LNE-LNHB**, IRMM, PTB, NPL |
| WP2 | Evaluation of radionuclide decay data | **LNE-LNHB**, CIEMAT-LMRI, IFIN-HH,IRMM |
| WP3 | Standardization of radionuclides for imaging and therapy | **PTB**, BEV, CIEMAT-LMRI, CMI-IIR, INMRI-ENEA, IRA, IRMM, IFIN-HH, LNE-LNHB, NPL, SMU |
| WP4 | Standardization of very short-lived nuclides for PET imaging | **IRMM**, BEV, CIEMAT-LMRI, INMRI-ENEA, IFIN-HH, LNE-LNHB, NPL, PTB, SMU |
| WP5 | IMPACT: exploitation, dissemination and knowledge transfer | **NPL,** BEV, CIEMAT-LMRI, CMI-IIR, INMRI-ENEA, IRA, IRMM, IFIN-HH, LNE-LNHB, PTB, SMU |

**WP 2: Evaluation of radionuclide decay data**

Emerging nuclides newly used or planned to be used in medical applications

- for Cu-67, only a rough decay scheme is available, the measurement of all decay data are required;
- for At-211, measurements of alpha emission intensities are required in priority;
- for Lu-177, new half-life and absolute gamma ray intensities are required in priority;
- for Ge-68 – Ga-68, the two half-lives, the absolute gamma ray intensities and the 511-keV annihilation photon intensity are required in priority;
- for Cu-64, the absolute gamma ray intensities, the K X ray emission intensities and the 511-keV annihilation photon intensity are required.

**WP 3: Standardization of nuclides for imaging and therapy**

Measurements off Cu-67, At-211, Lu-177, Ge-Ga-68, and Cu-64

The aim of this work package is then, for each one of those nuclides
- to create national activity standards able to be transferred to practitioners of the medical field through secondary standards,
- to establish their international traceability and to bring significant input in the BIPM KCDB,
- to determine with high accuracy decay data such as half-life, branching ratios and emission intensities.

For each selected nuclide, the following tasks are then planned.
- **Task 1**. Primary standardization in terms of activity
- **Task 2**. Measurement of decay data
- **Task 3**. Establishment of traceability and international equivalence among European NMIs and abroad
- **Task 4**. Transfer of the internationally equivalent standard to the secondary standards in the NMIs

**WP 4: Standardization of very short-lived nuclides for PET imaging**

Measurement of radionuclides like F-18, O-15, N-13 and C-11 for PET imaging due

**Task 1. Development of methods for the primary standardisation of short-lived radionuclides for PET**
(E.g. development of measurement facilities that can be moved to the production sites. Candidates: well-type detectors for $4\pi\gamma$ counting (primary method), a novel transportable TDCR set-up (primary method, under development) and ionisation chambers (secondary method).

**Task 2. Establishment of traceability and international equivalence among European NMIs and abroad**
Intercomparison, SIR etc.

**Task 3. Measurements of decay data where necessary**
emission probabilities, energies, half-lives

**Task 4. Transfer of the internationally equivalent standard to the secondary standards in the NMIs**

**WP 5: IMPACT: Dissemination, Exploitation and Knowledge Transfer activities**
**Tasks:**

Task 1 – Work package management and global deliverables

Task 2 – Dissemination of radionuclide specific data

Task 3 – Transfer of Knowledge to national stakeholders

Project was not considered for funding.

☹ ☹ ☹ ☹ ☹ ☹ ☹ ☹ ☹ ☹ ☹ ☹

LNHB proposed to measure Cu-64, Cu-67 and At-211 within the scope of EURAMET exercises.

Interested labs (to my knowledge):

- LNHB
- NPL
- PTB
- ENEA
- …

Other possibilities to get funding?

- IAEA?
- European Commission?
- …