

PIANOFORTE-WP5 Workshop

INFN-LNS Catania
29/Jan/2024

Parallel Session

Best practices for *Intercomparisons* and *Quality Assurance*

*(in infrastructures related to
radiation protection research)*

**WP5: Infrastructures and data management for
radiation protection research**

One of the PIANOFORTE WP5 objective:
Promoting infrastructure harmonization of
quality standards, practices and protocols

- **Involvement of infrastructure representatives**
- **Development of a system for funding inter-comparisons**
 - Review and identify methods for harmonization and standardization of most representative infrastructure classes
 - Define performance parameters → select “gold standard” infrastructure examples.
 - Identify and develop systematic inter-comparisons, funded and carried on effectively.
- **Development of SOPs for key protocols to promote standardization**
 - Analyze existing Standard Operating Procedures, propose improvements (if any) and then test them

To be taken into account

- Infrastructures heterogeneity
- Existing Concert AIR2D2 database as starting point
- Intercomparisons experience, both technical aspects and funding scheme in current and previous projects / networks / platforms:
 - EURADOS
 - EURAMET / Ionizing Radiation
 - ALLIANCE,
 - EURAMED,
 - MELODI,
 - NERIS,
 - RENEB ...
- **Get input and feedback from infrastructure experts, representatives, users**

Best Practices for

Intercomparison

- essential for proper research harmonization and standardization
- keep adequate level of quality
- a way to improve experiences and competences of owners and users

Quality assurance

- maintaining the required standard from effective radiation protection research

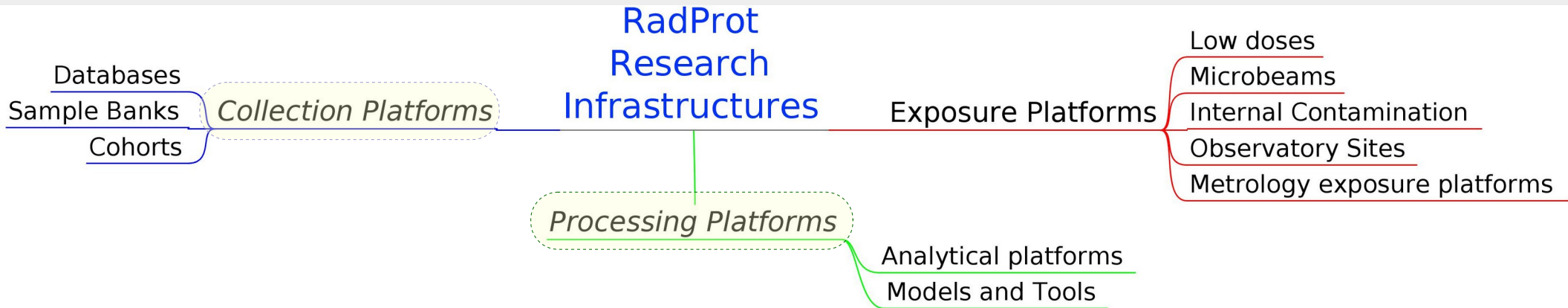
Inter-comparison aspects

- identify target(s)/end point(s) of comparison (performance parameters/indicators)
- definition of the experimental protocol
- comparison preparation
- responsibilities, e.g. pilot laboratory
- requirements of participants
- funding scheme
- update comparison status
- final reporting

(derived from EURAMET approach)

Infrastructure databases

Concert AIR2D2: <https://www.concert-infrastructures.eu/>



OFFERR: <https://snetp.eu/offerr-brochure/>

IAEA – Accelerator Knowledge Portal (accelerators DB and more):

<https://nucleus.iaea.org/sites/accelerators/Pages/default.aspx>

ESA – Radiation Test Facilities and test data for radiation hardness assurance and component analysis:

<https://escies.org/webdocument/showArticle?id=227&groupid=6>

ASIF – ASI Supported Irradiation Facilities: <http://www.asif.asi.it/>

....

they somehow represent
“meta” infrastructures that
should be harmonized to
some extent

Infrastructure Characterization Data

General Information (name, address, brief description, fields of application, ...)

Contact Information

Access rules, including ethical/legal limitations, e.g., GDPR (General Data Protection Regulation) permission when applicable, proposal submission and evaluation procedure ...

User support, technical depending on facility type: instrumentation available during the irradiation, search interface for databases ..., logistics such as housing ...

Delivered Service Technical specifications (including quantitative specification of condition of delivery, when applicable)

Mode of operation (e.g., experiment completely run by the facility, material or equipment from user, by facility and user, run by user)

Applicable standards and regulations (including quality control procedures)

Service Costs ...

Facility specific details, e.g., for irradiation facility: type of particles, energy spectrum, intensity range, mode of delivery, ...; for biobank: exposure scenario, data associated to samples, ...

Quality Parameters (1/2)

External Exposure:

- type of radiation (impurity from other radiations)
- energy
- spatial intensity profile on sample
- direction distribution on sample
- Short and long term stability
- [derived: dose, dose rate]
- ...

Internal Exposure:

- type of radionuclide
- chemical form (contaminants)
- activity of radionuclide
- [derived: dose, dose rate]
- ...

Contaminated sites:

- radionuclide(s) source of contamination
- activity spatial distribution at given date(s)
- ...

Quality Parameters (2/2)

Analytical Platforms:

- sample characteristics quantification (e.g. radioactivity spectroscopy)
- standards exist for specific methodological analysis
- ...

Biobanks/Cohorts:

- sample annotations
- aspects of specimen collection, processing and preservation
- ...

Models:

- Montecarlo codes; absorbed dose estimation
- ...

new intercomparisons involving different classes of infrastructures ???

Expected Contributions on

- Characterization and qualification data of infrastructure classes → can be used to:
 - improve/extend the existing infrastructure catalog(s)
 - promote infrastructures
 - help users to select most appropriate infrastructure for the specific needs
- Critical technical aspects in running services
 - performance stability and assessment
 - user support
- Ideas and questions are welcome

... Let us start with a round table presentation