

**“Nuclear for the benefit of  
society”**

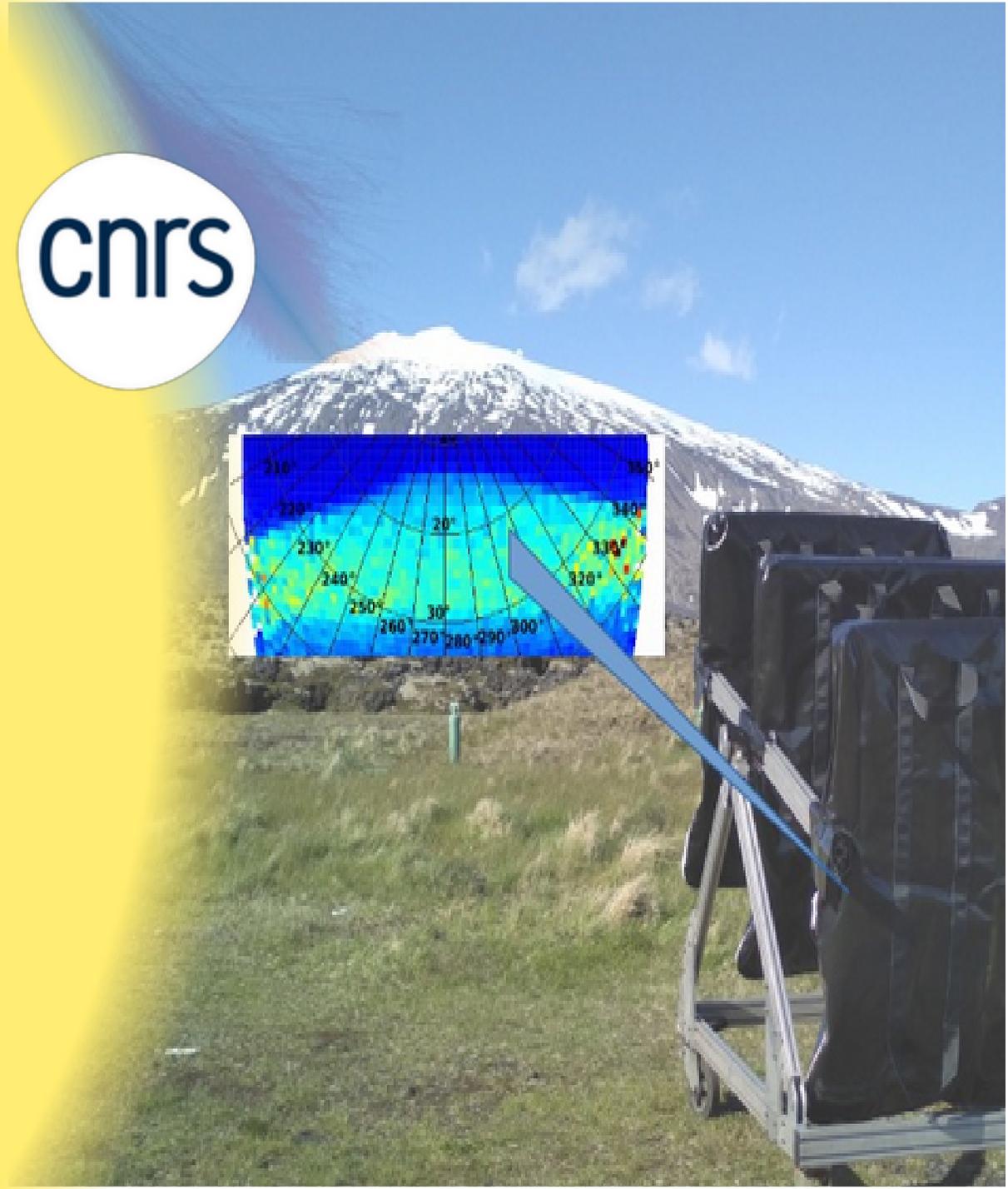
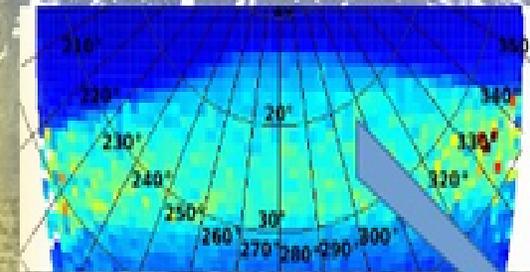
**&**

**“Interdisciplinarity”**

**CNRS Nuclei & Particles  
IN2P3**

**Jacques MARTEAU**

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# Master-Projets organization

## 3 science drivers / 11 master-projects

### Axis 1 : Nuclear science for fission energy production

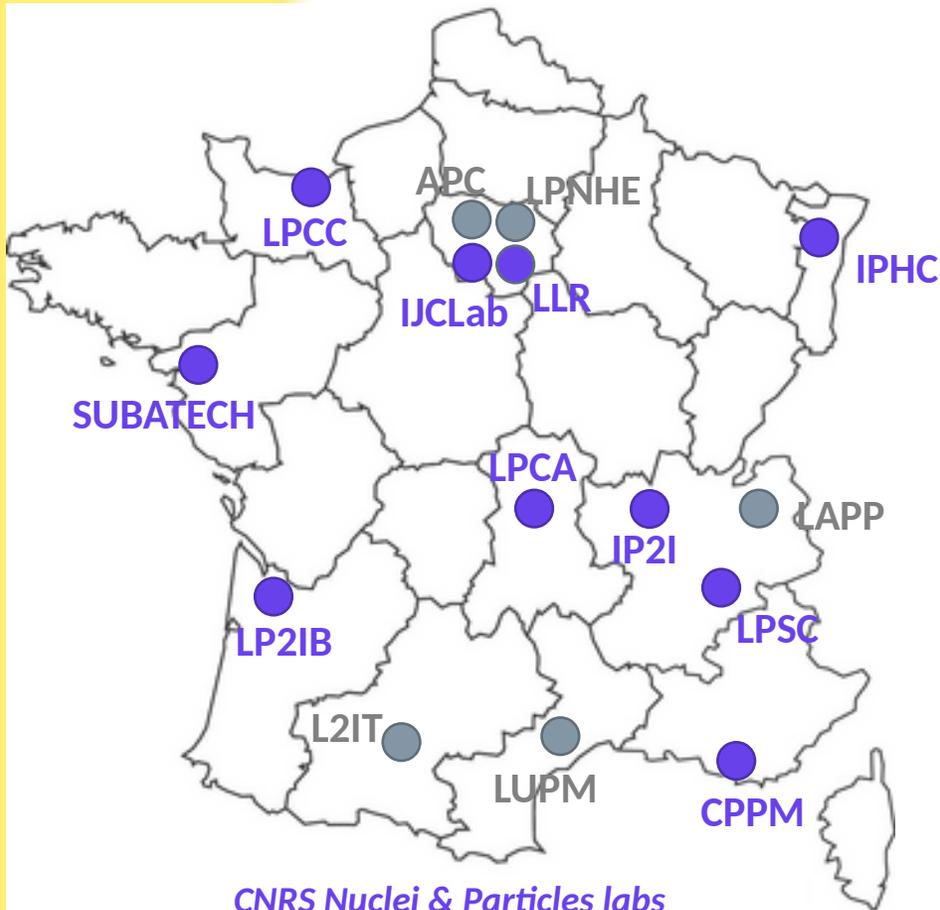
- Cross-section measurements (DONEEE)
- Reactors & cycle physics (PRECY)
- Materials under extreme conditions (MATRIX)
- Dismantling & radioecology (DAIDEMIN)

### Axis 2 : Health

- Hadrontherapy
- FLASH
- Targeted radiotherapies
- Radionuclides for therapy and diagnosis

### Axis 3 : Environment

- Terrestrial radioecology
- Radioecology & oceans
- Radon & radionuclides in the environment



CNRS Nuclei & Particles labs  
involved in societal applications



NUCLÉAIRE  
& PARTICULES

# IN2P3-INFN workshop on Health, Environment & Cultural Heritage

**GOAL :** identifying common collaborative scientific objectives to be shared within a general framework (MoU-type) for transnational access and science cooperation

**DATES & PLACE :** December 11th & 12th, Istituto Nazionale Fisica Nucleare, Palazzo Lante, Piazza dei Caprettari, 70, 00186 Roma RM, Italie

## (December 11th)

- 13:30-14:00 Welcome and introduction

### Theme 1 : Health

- 14:00-15:00 Conventional hadrontherapy (*S.Mercatili, G.Cuttone*)
- 15:00-16:00 FLASH & targeted radiotherapies (*L.Maigne, M.L.Gallin-Martel, V.Patera*)
- *Coffee break*
- 16:30-17:30 Radionuclides for therapy and diagnosis (*A.Ouadi, F.Azaiez*)

### Theme 3 : Tools (1)

- 17:30-18:30 Irradiation platforms (*A.Gentils, L.Latronico*)

## (December 12th)

### Theme 3 : Tools (2)

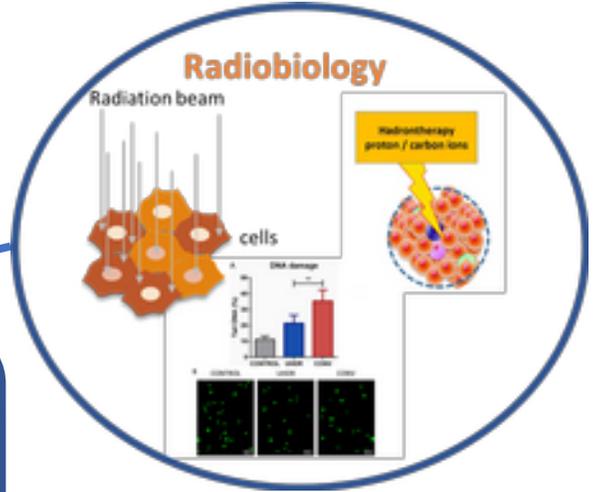
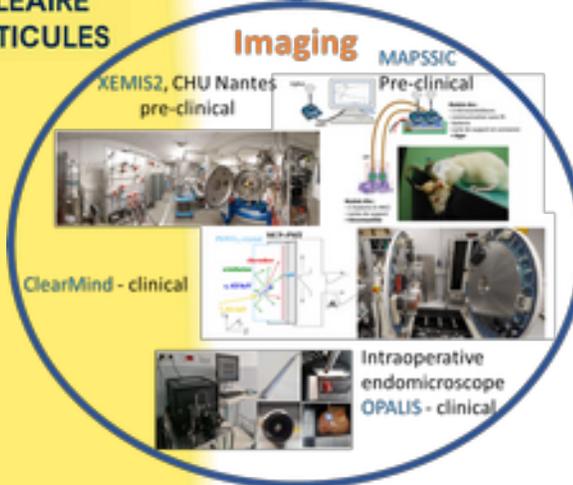
- 08:00-09:00 Computing (*L.Maigne, A.Retico*)

### Theme 2 : Environment

- 09:00-10:00 Terrestrial/Oceanic radioecology (*P.Chardon, M.Sisti*)
- *Coffee break*
- 10:30-11:30 Muography (*J.Marteau, L.Cimmino*)
- 11:30-12:00 Nuclear techniques for cultural heritage and environment (*J.Marteau, F.Taccetti*)
- 12:00-13:00 Radon monitoring and measurements (*L.Terray, S.Romano*)
- *End of the workshop*

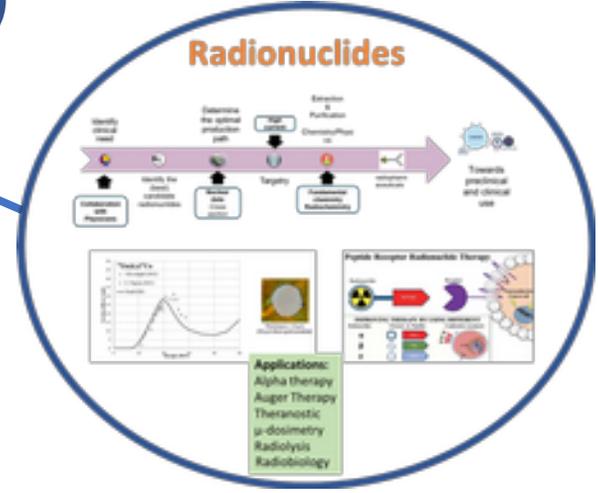
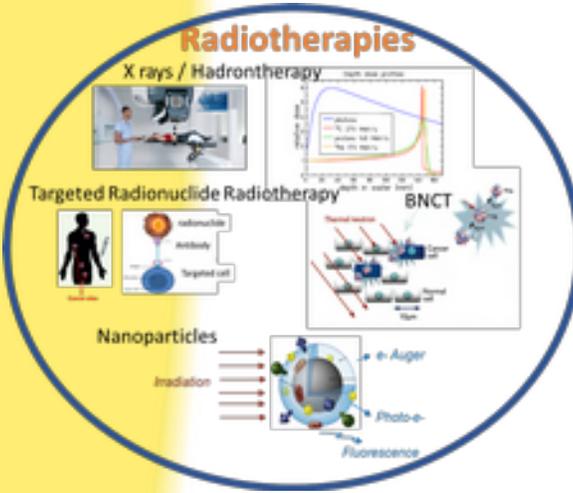


# Axis 2 - Health



**Scientific Objectives**

Using ionizing radiation to **understand their effect on living matter** and participate to the **development of therapeutic applications** against cancer.



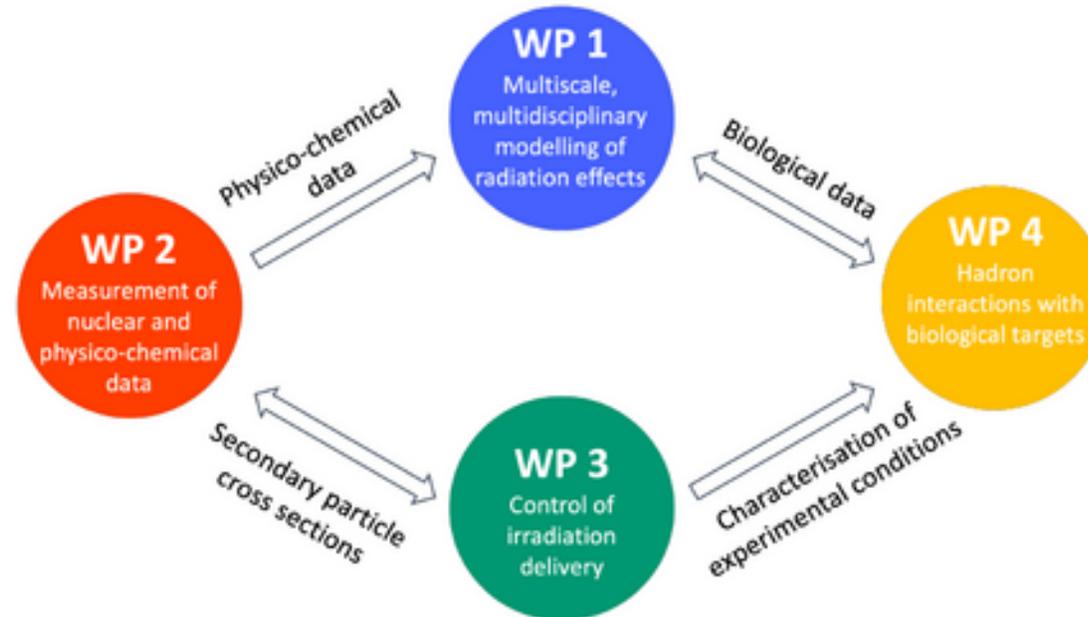
**Science driver :**  
**RadiationS for Health**

# Internal organization of the Health axis

## 4 master-projects

### Hadrontherapy (137 FTE for the 2026-2029 period)

- **WP1** : Multiscale, multidisciplinary modeling of radiation effects  
(Lead: Juliette Thariat, LPC Caen)
- **WP2** : Measurement of nuclear and physico-chemical data (Lead: Marie Vanstalle, IPHC)
- **WP3** : Control of irradiation delivery (Lead: Sara Marcatili, LPSC)
- **WP4** : Hadron interactions with biological targets: from cells to patients  
(Lead : Claire Rodriguez-Lafrasse, IP2I)



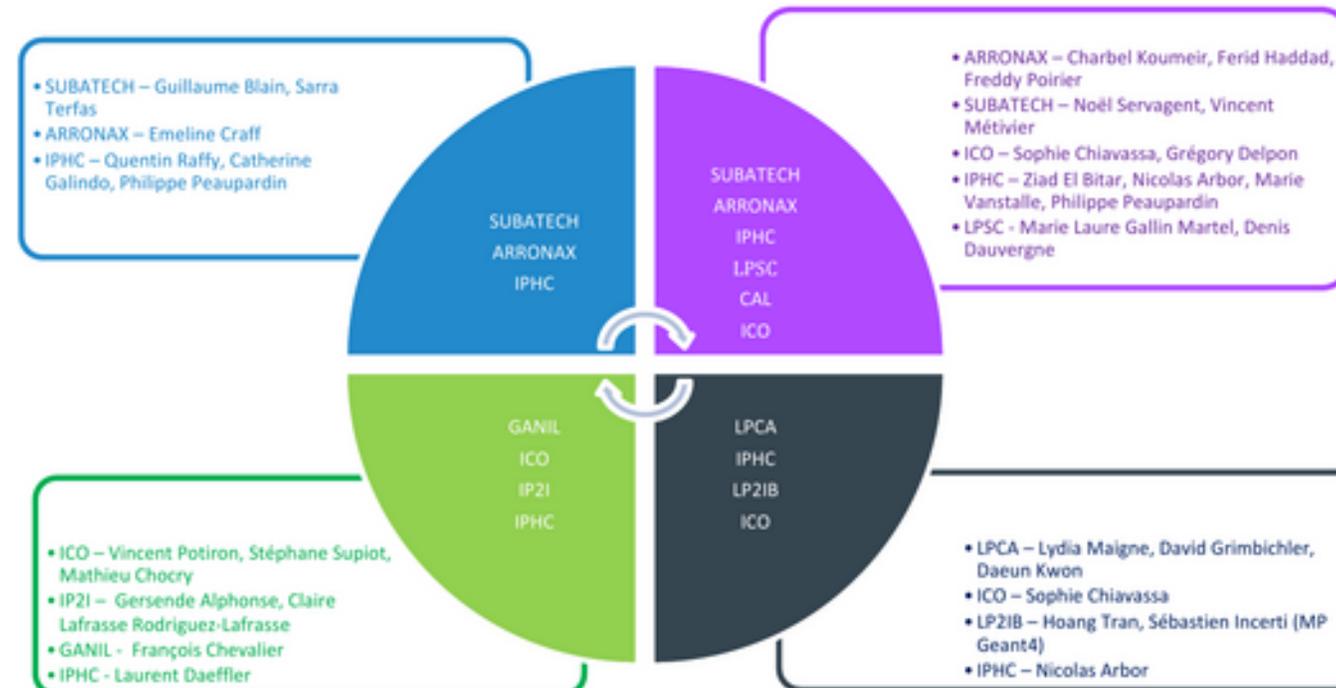
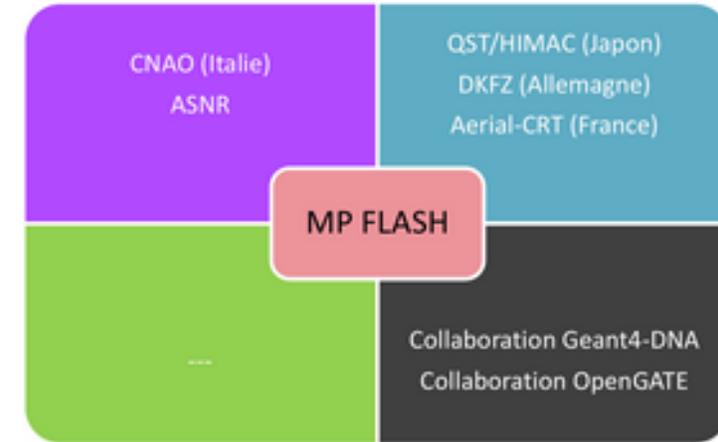
Schematic view of interconnections between WPs.

# Internal organization of the Health axis

## 4 master-projects

### FLASH (24 FTE for the 2026-2029 period)

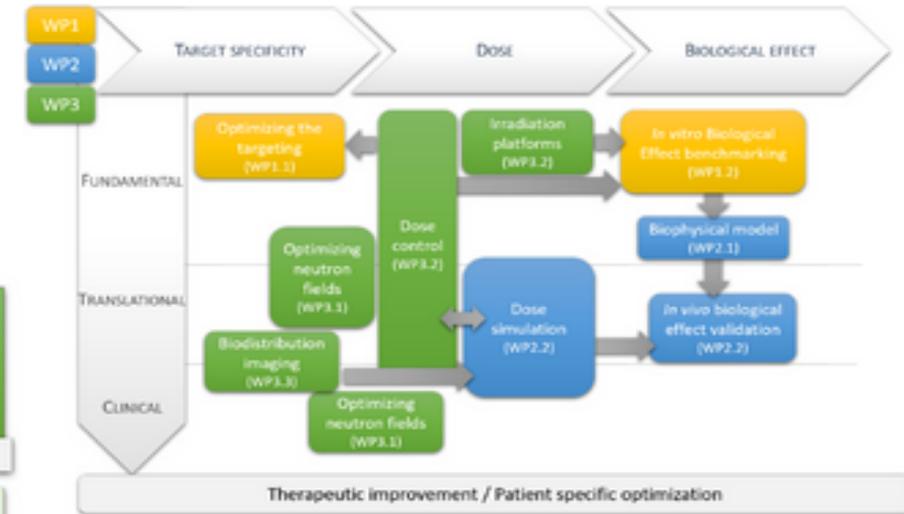
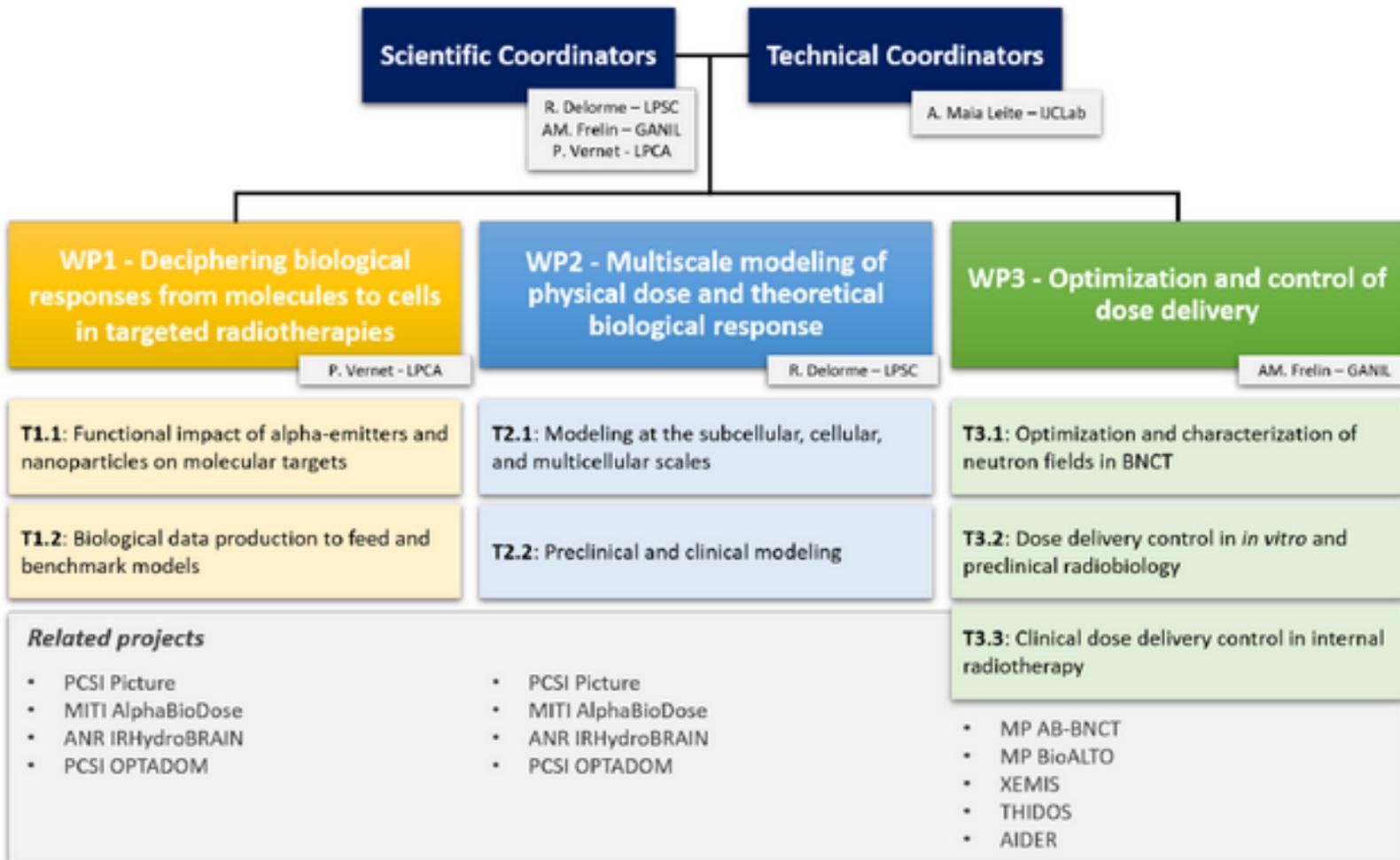
- **WP1** : Description and validation of tools  
(Lead: Charbel Koumeir (ARRONAX), Ziad El Bitar (IPHC))
- **WP2** : Effect of the dose on the experimental water radiolysis  
(Lead: Guillaume Blain (Subatech), Quentin Raffy (IPHC))
- **WP3** : Cells populations irradiations (Lead: François Chevalier (GANIL))
- **WP4** : GATE multi-scale digital twins (Lead : Lydia Maigne (LPCA), Nicolas Arbor (IPHC))



# Internal organization of the Health axis

## 4 master-projects

Targeted radiation therapies  
(39 FTE for the 2026-2029 period)

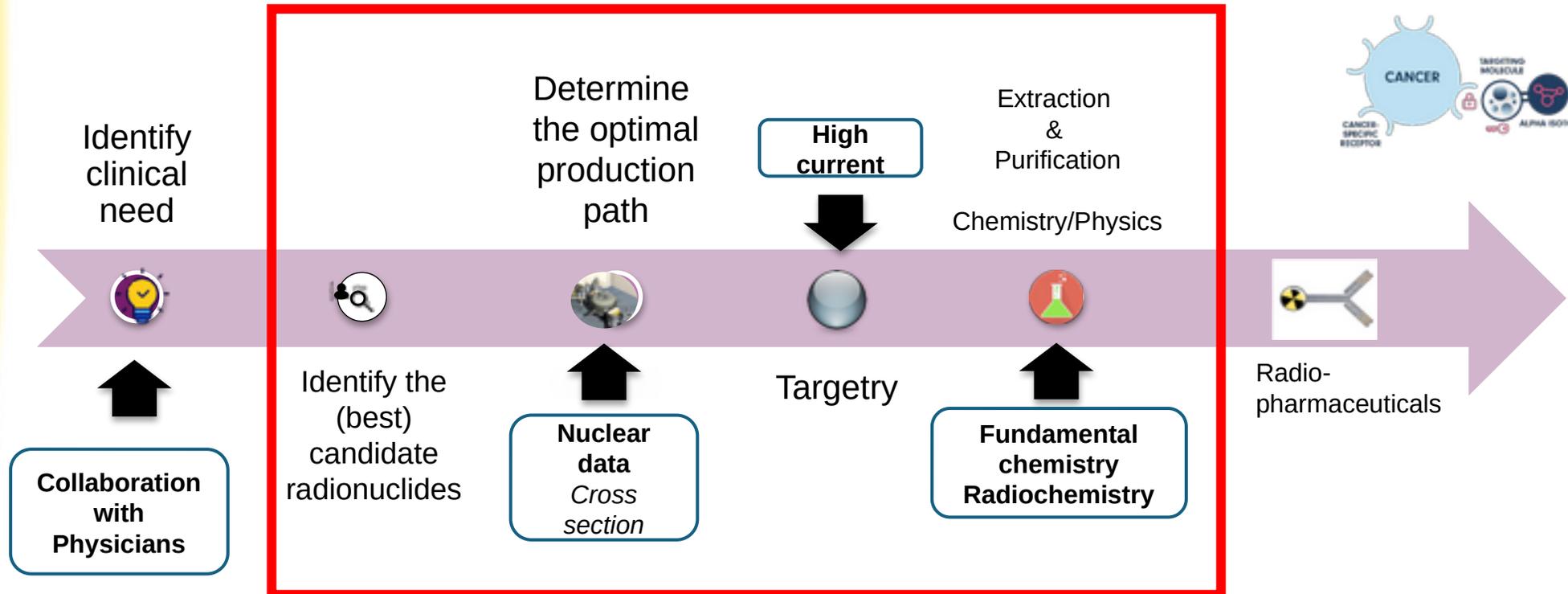
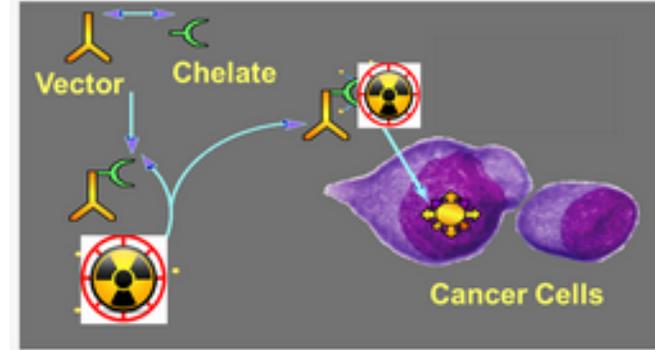


# Internal organization of the Health axis

## 4 master-projects

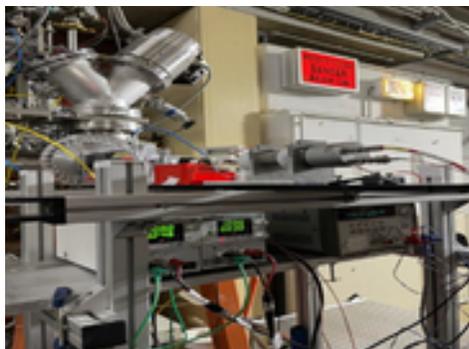
### Radionuclides (44 FTE for the 2026-2029 period)

- **WP1** : High LET particles (*Lead: F. Haddad (ARRONAX)*)
- **WP2** : Theranostic solutions (*Lead: A. M. Frelin (GANIL)*)
- **WP3** : Innovative radionuclides production (*Lead: V. Métivier*)
- **WP4** : Separation, formulation and radiomarking (*Lead : A.Ouadi (IPHC)*)
- **WP5** : Imaging and dosimetry (*Lead : F.Boisson (IPHC)*)



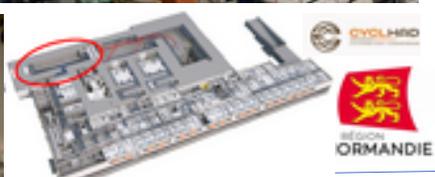
# Irradiation platforms

GANIL



ALTO

ARRONAX

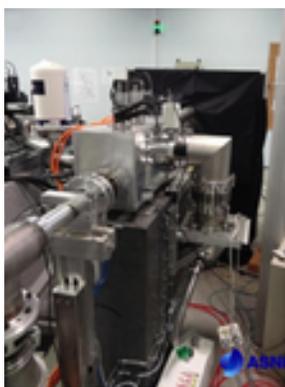


**C400, carbon beams**  
With dedicated « research rooms »  
= on-going discussion with IN2P3  
and others partners!



CYRCé

AIFIRA



CAL, Nice



CNAO

