SIRIC Montpellier Cancer

Professor David AZRIA

SIRIC
MONTPELLIER CANCER
Site de Recherche Intégrée sur le Cancer

6th December 2022

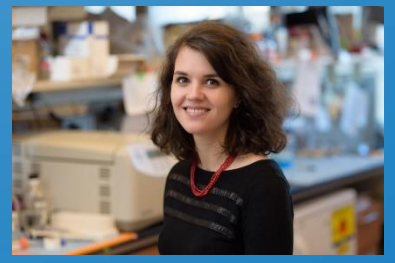
SIRIC Montpellier Cancer audition team

David AZRIA
Head of Radiation Oncology Dpt
Scientific Director ICM

Nathalie BONNEFOY
Director of IRCM

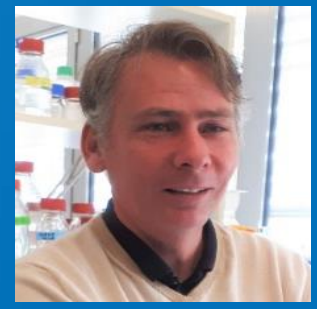
Vanessa GUILLAUMON
SIRIC General Manager

Sophie POTY
Doctor in chemistry
Expert in RPT



Florence COUSSON-GELIE
Scientific Director of Prevention Center (ICM)
Co-Director of Epsylon Laboratory

Laurent LE CAM
Team Leader at IRCM
Deputy director IRCM



Presentation outline

- **Context and environment of the application**
- **Project 2023-2027**
  - Partner institutions
  - The new strategic action plan
    - Governance and management
    - Scientific strategy
    - Health democracy policy
  - Provisional budget
- **Conclusion**

Presentation outline

- **Context and environment of the application**

ject 2023-2027

Partner institutions

The new strategic action plan

- Governance and management
- Scientific strategy
- Health democracy policy

Provisional budget

clusion

Faculties of Medicine of Montpellier

Montpellier:
Territory of research and innovation

❑ National leading academic research community

- TOP 5 in BioHealth
- Shanghai Ranking : TOP 200 World, TOP 4 France outside Paris

❑ Recognised for its scientific excellence

MUSE
MONTPELLIER UNIVERSITY OF EXCELLENCE

- Labelled by the French State for “Feed-Protect-Cure” Programme

❑ Strong innovative capacity

Montpellier Méditerranée Métropole

BIC BUSINESS & INNOVATION CENTRE

- Incubator Business Innovation Center: World Top5 UBI Global
- One of the 5 French « University Innovation Cluster »

❑ Active political support

MEDVALLÉE MONTPELLIER

- Med Vallée project of Montpellier Metropolis dedicated to Biohealth

SIRIC has been key for structuring cancer research in Montpellier since 2013

Translational research capacity

Novel cutting-edge resources and core facilities

Collab. clinicians & researchers

×4 clinicians in labs
ERC 2022 Starting Grant (MD)

Tech transfer & valorisation

4 new start-up companies
NovaGray, DiaDx, MabQi, Diag2Tech

Training in cancer research

« Cancer Biology » Master II program Erasmus Mondus

Interdisciplinary research

New strategic partnerships with the Chemistry and MIPS communities

Strong leverage effect

Up to ×10
from SIRIC seed funding

SIRIC
MONTPELLIER CANCER
Site de Recherche Intégrée sur le Cancer

Prof. Marc YCHOU
SIRIC Director 2013-2022
Current ICM General Director

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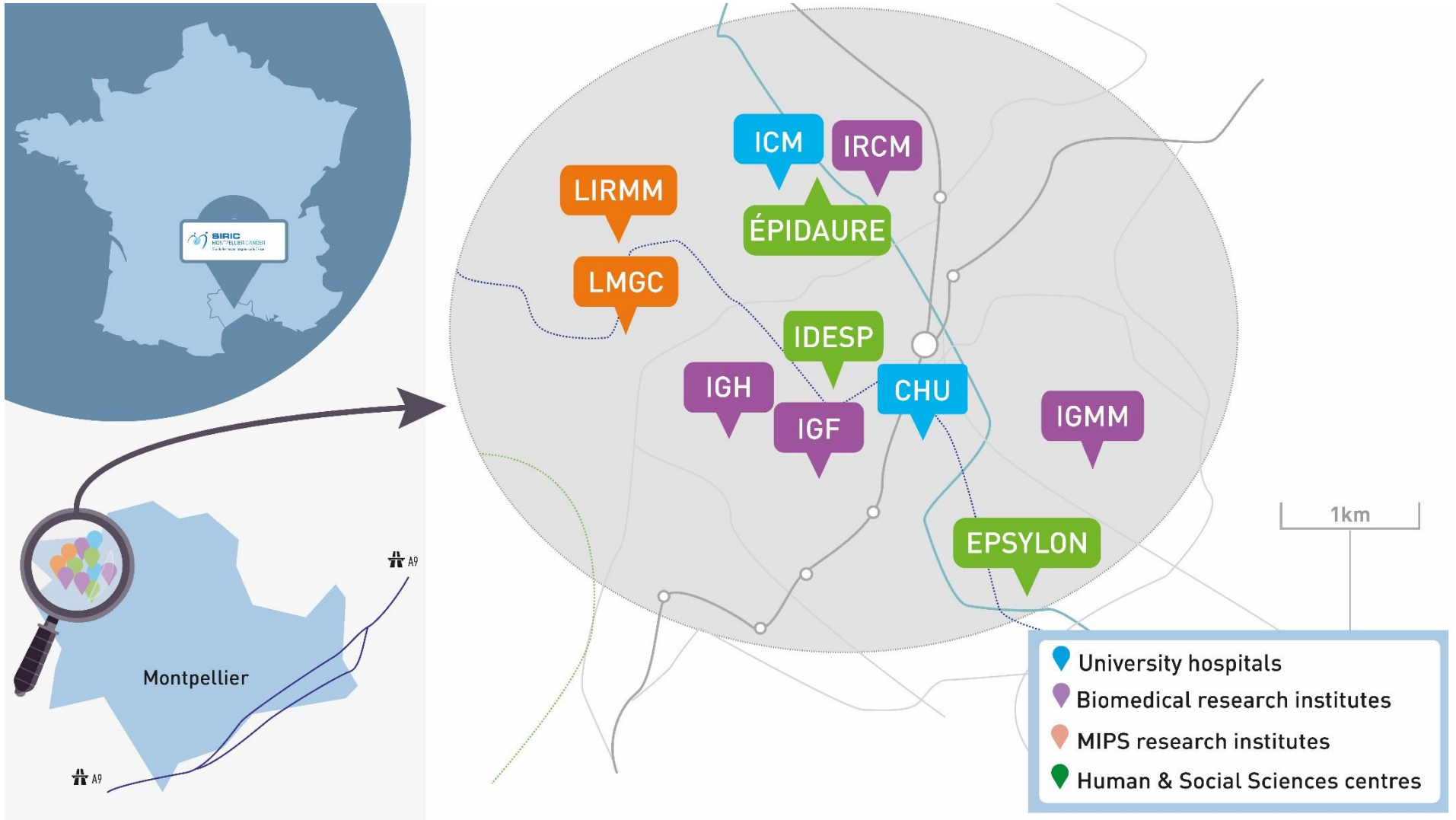
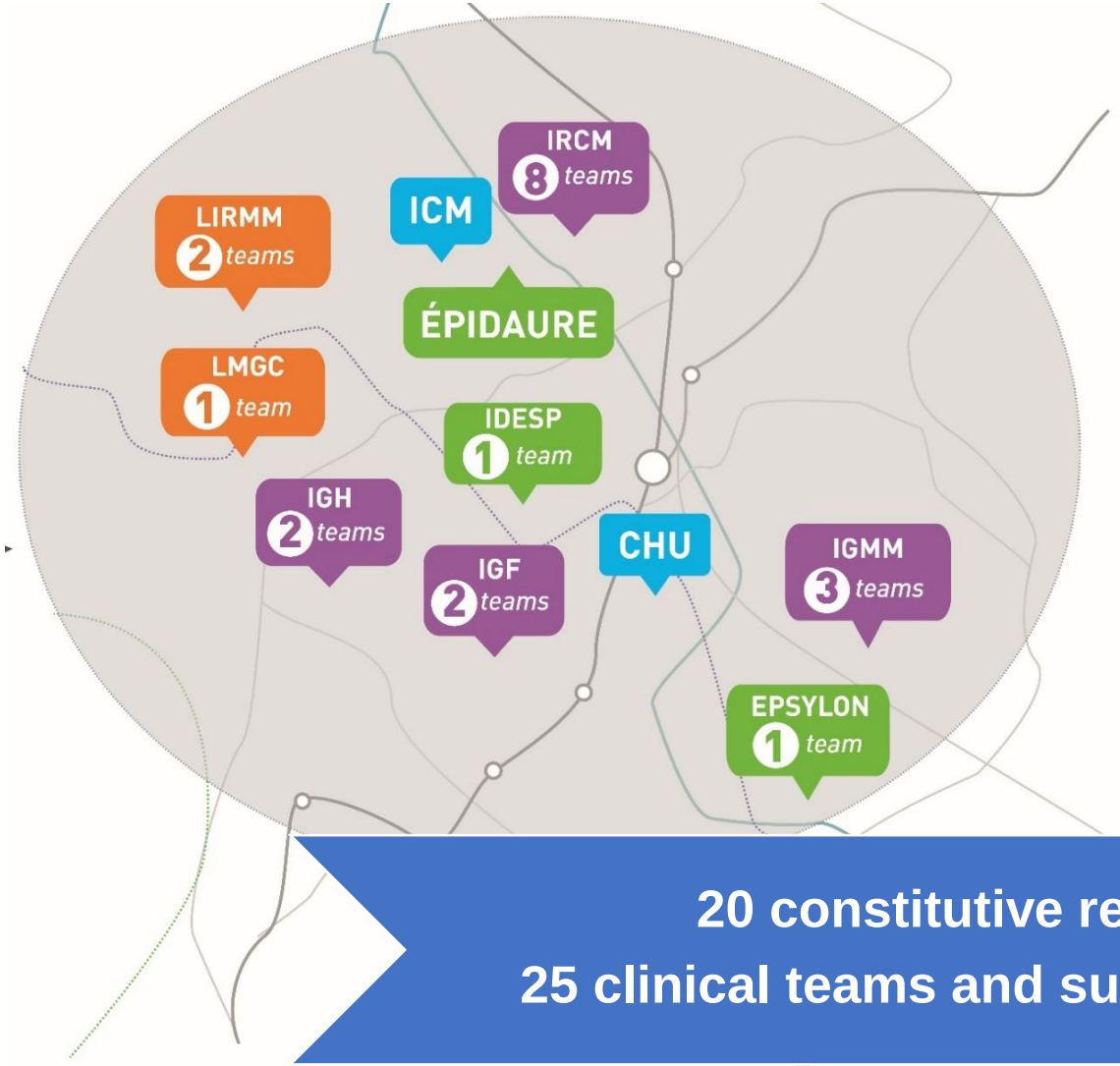
SIRIC Montpellier Cancer

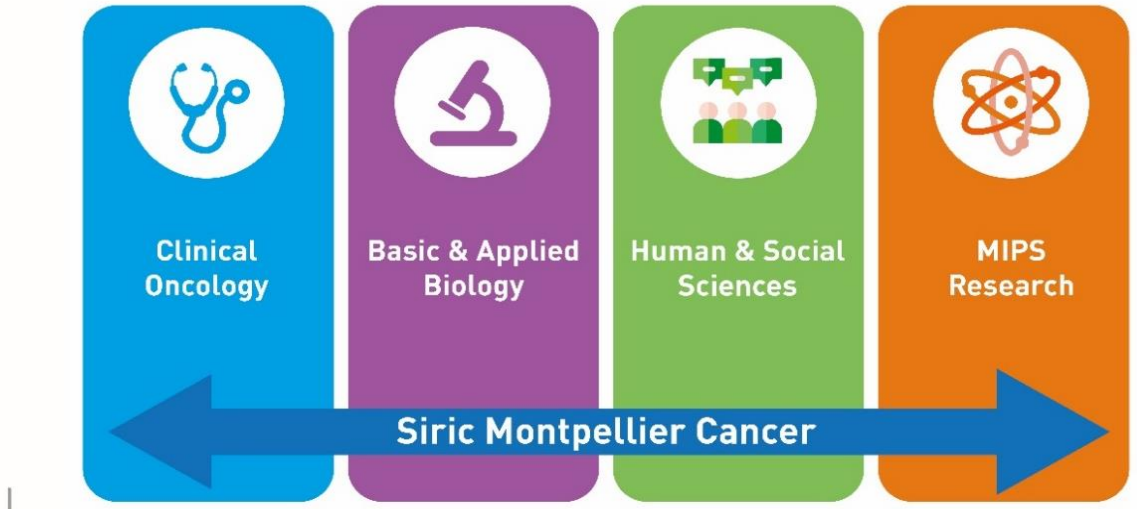
Critical mass of key oncology leaders within a 1-km radius



SIRIC Montpellier Cancer

Integration of medical, scientific and societal research in oncology





20 constitutive research teams

25 clinical teams and support infrastructures

Montpellier Cancer Institute

1 KM

Montpellier University Hospital Centre

Montpellier clinical oncology

Multidisciplinary clinical expertise

Two major university hospitals

- ❑ **200 physicians** in oncology
- ❑ Active file of **50,000 patients/year**
- ❑ **> 2,000 patients** enrolled in clinical trials annually
- ❑ A portfolio of **250 clinical studies / year**

High-quality clinical research

- **Clinical and Translational Research** certified ISO 9001
- **Biometry** certified ISO 9001
- **ICM/CHU Early-Phase Clinical Trial Centre** certified by INCa
- **Unique French Datacentre** for UNICANCER Federation

A strong synergy of expertise in cancer biology

IRCM and 3 multi-thematic research institutes including top-notch research groups involved in cancer biology

Institute of Cancer Research of Montpellier

- Focus exclusively on cancer research

Institute of Molecular Genetics of Montpellier

- Basic research on liver biology, T-cell differentiation and immunotherapy

Institute for Functional Genomics

- Expertise in epigenetics

Institute of Human Genetics

- Expertise in genome dynamics and epigenetic controls

A unique cluster of expertise in Human and Social Sciences applied to cancer

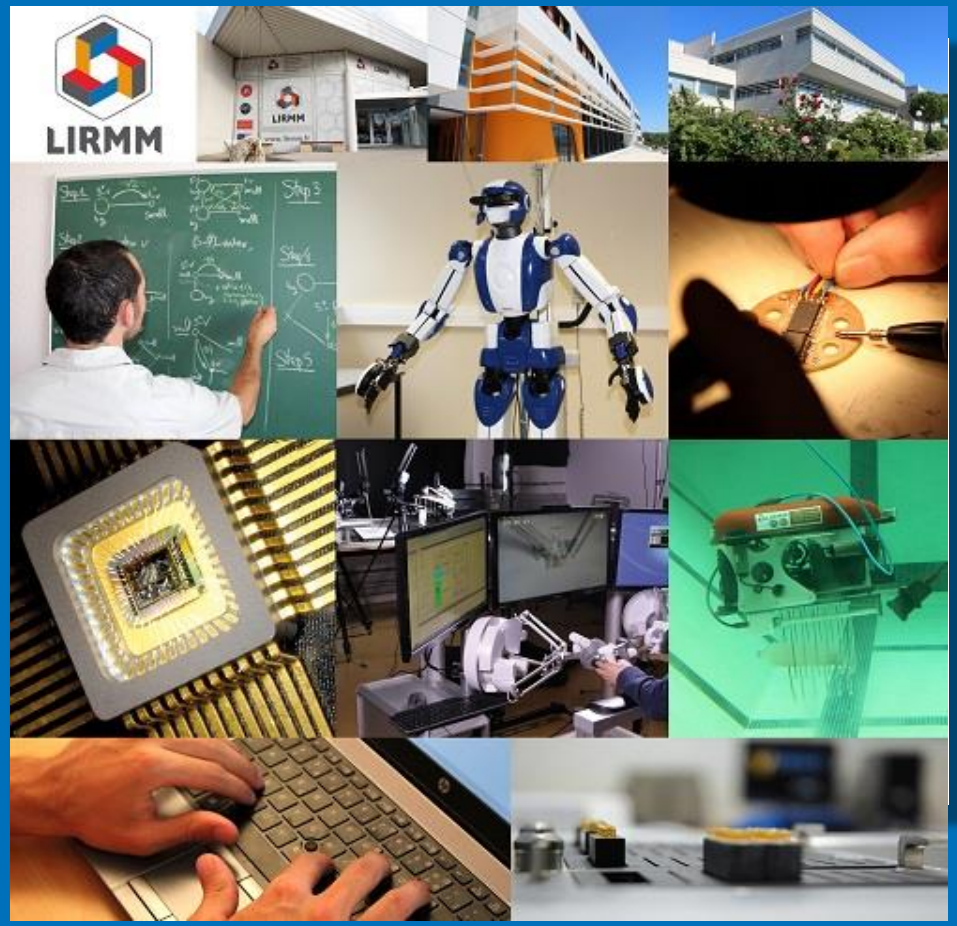
Highly specialised in interventional research

ICM Prevention & Health Education centre « Epidaure »

ICM Supportive Care Department

Laboratory of Psychology

Desbrest Institute of Epidemiology & Public Health



Two major research institutes in MIPS

newly integrated into the SIRIC Montpellier Cancer

Laboratory of Computer Science, Robotics and Microelectronics of Montpellier

Laboratory of Mechanics and Civil Engineering

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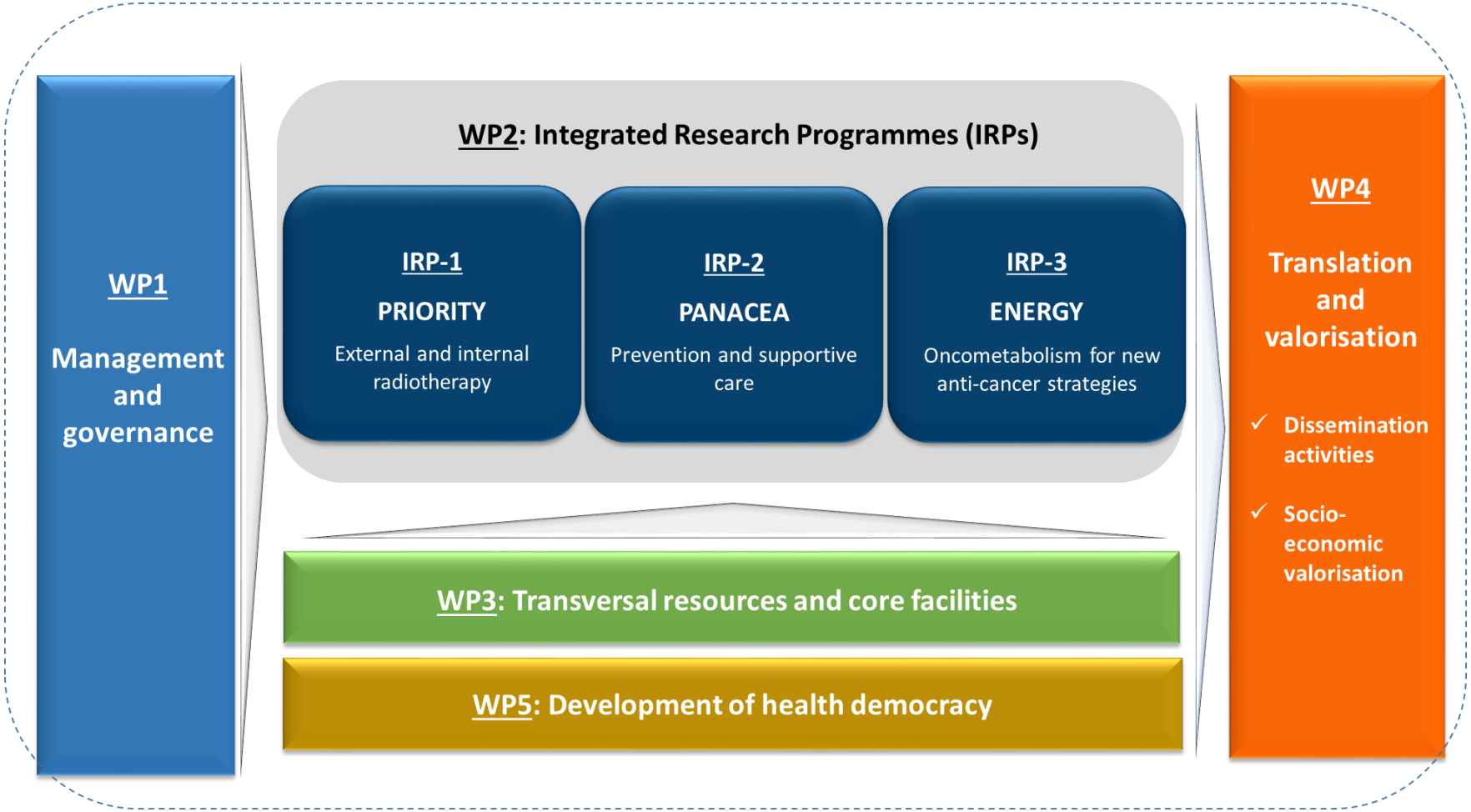
SIRIC 3 in the new 5-year strategic action plan

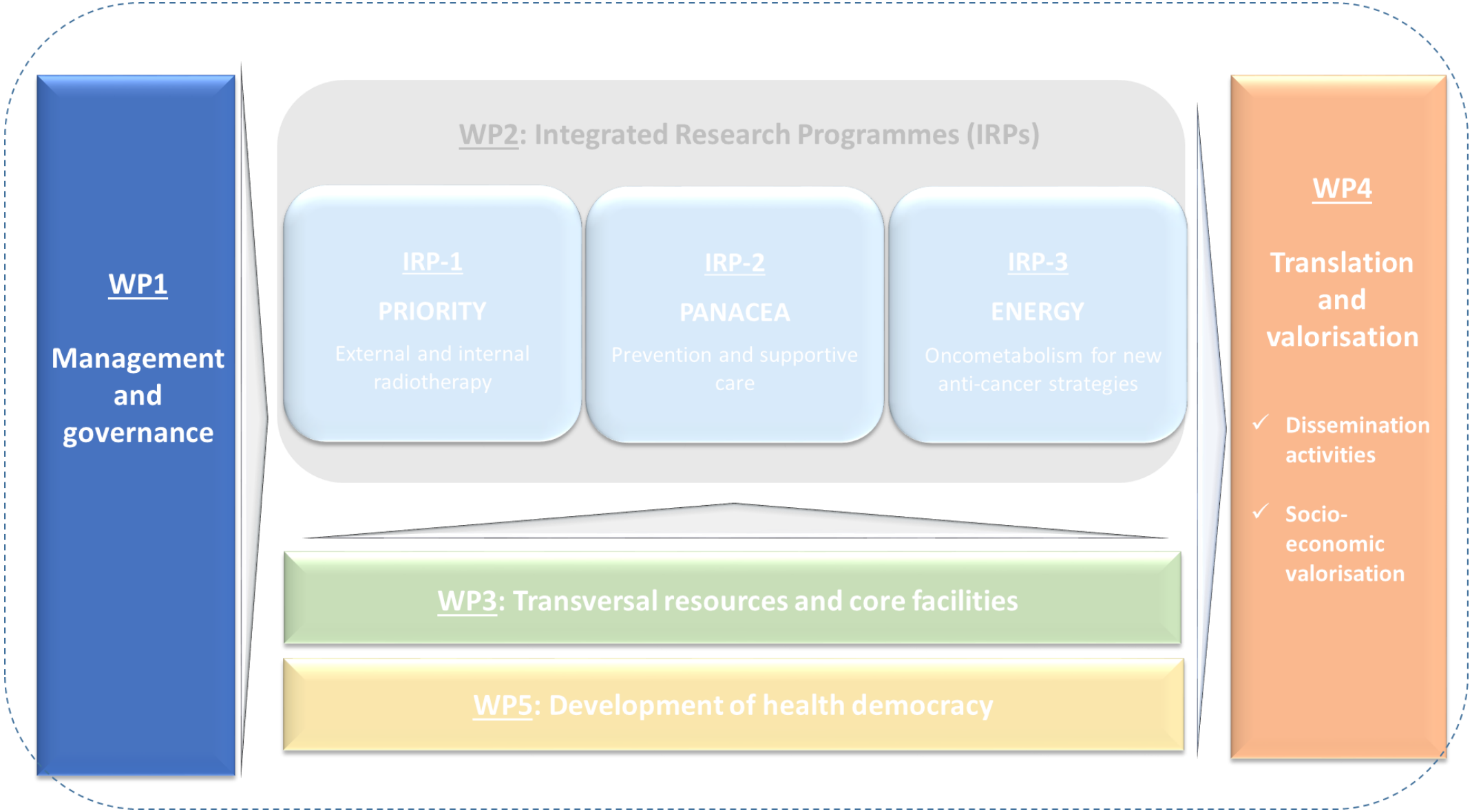
« Practice-changing » SIRIC

To change the patient's care pathway by a multilevel approach

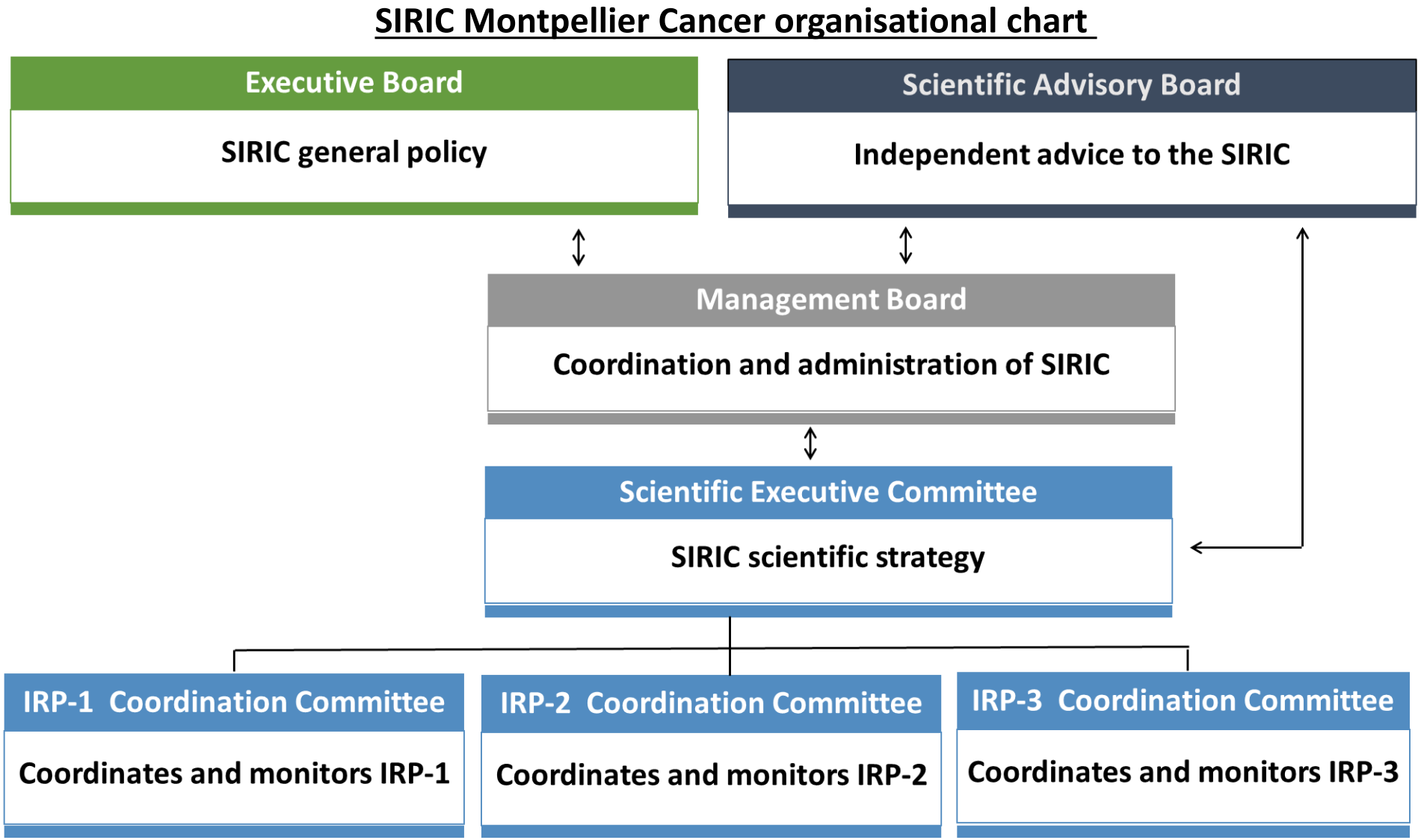


SIRIC MONTPELLIER CANCER
Site de Recherche Intégrée sur le Cancer

Strategic action plan



WP1 A similar and robust governance and managerial organisation



Scientific Advisory Board

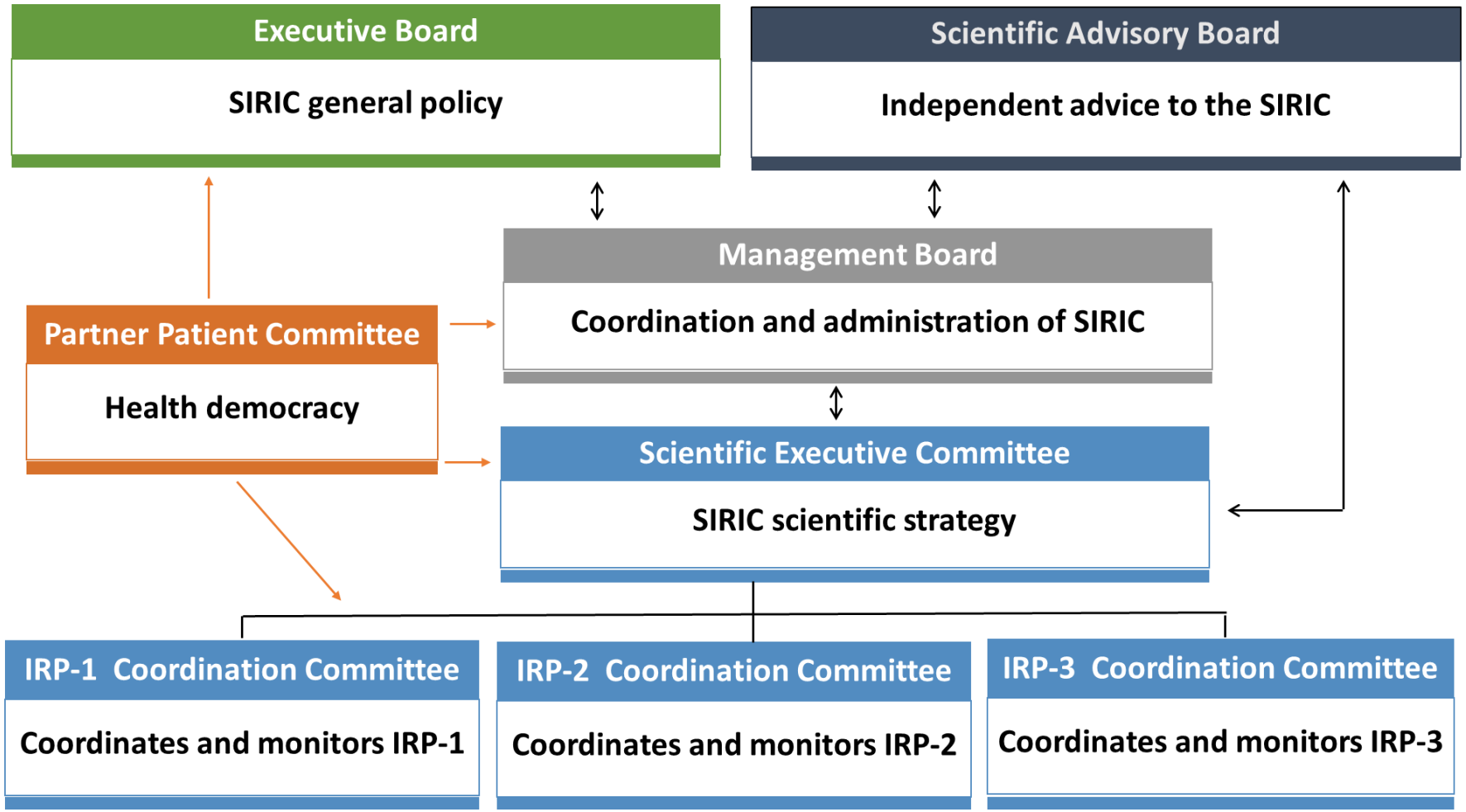
Connections with international top-notch research institutes

8 internationally leading scientists

- **Vickie Baracos**, Palliative Care Medicine, University of Alberta (Canada)
- **Christian Frezza**, Metabolomics in Aging, University of Cologne (Deutschland)
- **Marie Johnston**, Health Psychology, University of Aberdeen (Scotland)
- **Florian Lordick**, Medical Oncology, University Cancer Center Leipzig (Deutschland)
- **Esat Mahmut Özsahin**, Radiation Oncology, University Hospital Lausanne (Switzerland)
- **Kevin Prise**, Radiation Biology, Belfast Queen's University (Ireland)
- **Hebert Alberto Vargas**, Medical Imaging, Memorial Sloan Kettering Cancer Center, New York (US)
- **Mariia Yuneva**, Oncogenes and tumor metabolism, Francis Crick Institute, London (UK)

WP1 A similar and robust governance and managerial organisation

SIRIC Montpellier Cancer organisational chart



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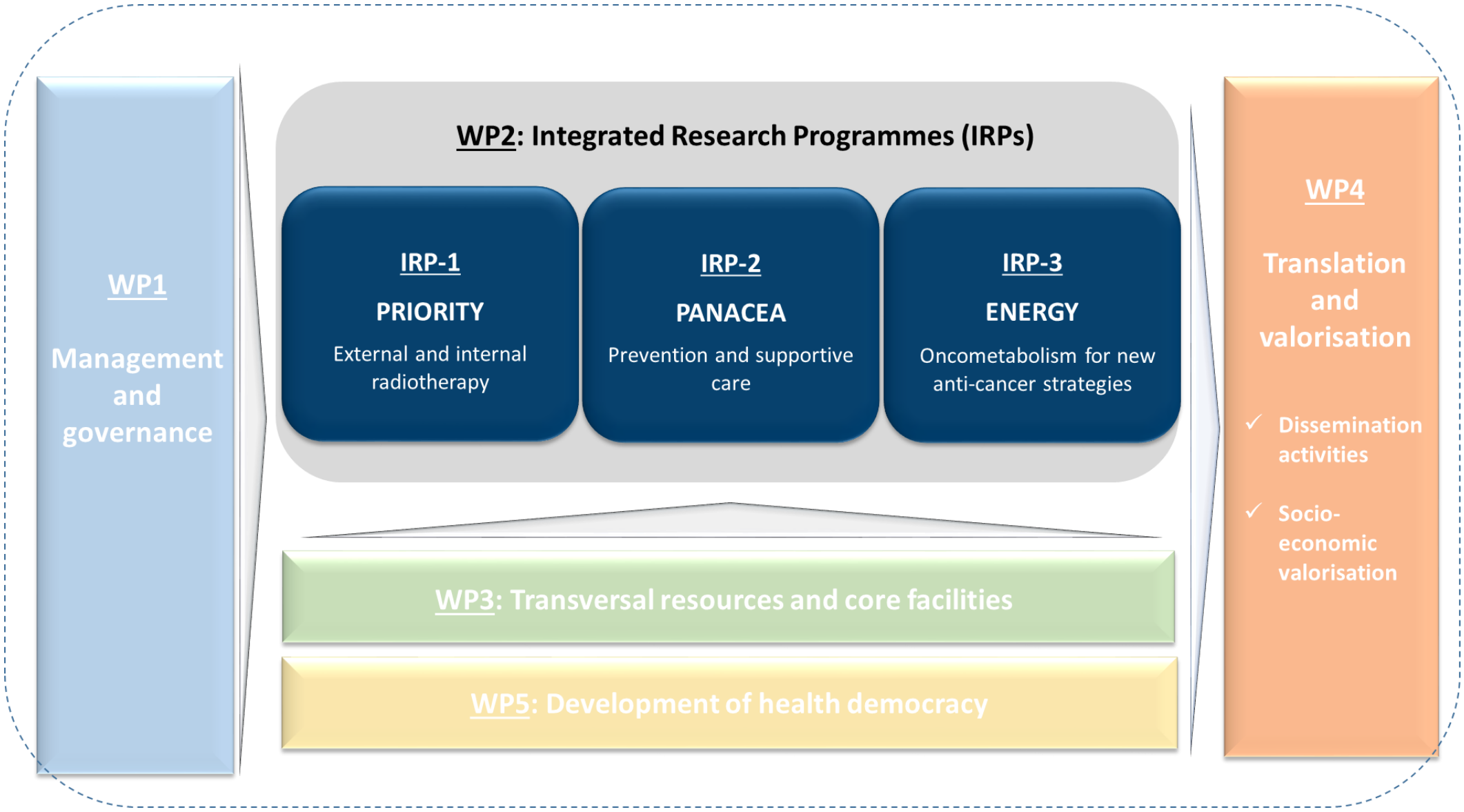
Site de Recherche Intégrée sur le Cancer

Strategic action plan



WP2

We selected 3 IRPs to change the patient's care pathway by a multilevel approach

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We selected 3 IRPs to change the patient's care pathway by a multilevel approach

IRP-1

Integrating imaging, biology and dosimetry to optimize RIT and EBRT

Unique research integrating network of leaders in ionising radiation treatments

Unique INSERM group in France including radiation sciences, imaging and cancer biology

Radiobiology, radionuclide therapy (alphatherapy), external RT, radiophysics, dosimetry, immunology, TME, imaging

Multidisciplinary clinical expertise

Innovative radiation therapy, reference centres for PDAC and HCC, world leading expertise in MRI, clinico-biological databases of PDAC and HCC

A network of experts in MIPS

Computational science, AI, thermodynamics of materials

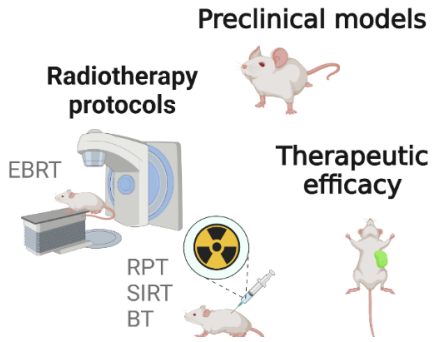
Cutting-edge core facilities

- Preclinical models
- Experimental radiotherapy
- Genomics proteomics
- Imaging Mass Cytometry
- Small animal imaging
- Experimental histology

IRP-1

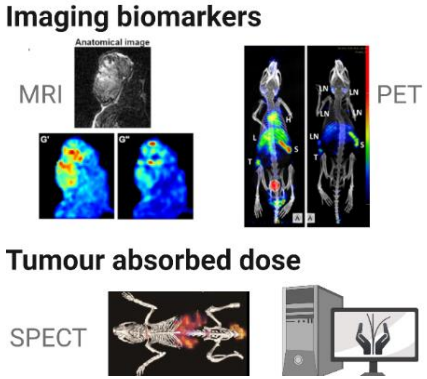
Four interconnected research axes

1 - Optimise irradiation of PDAC and HCC using preclinical models



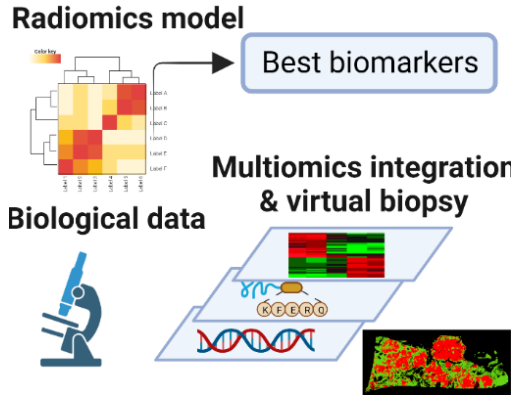
- **Tasks 1-2:** Establish **preclinical models and irradiation protocols** of PDAC and HCC
- **Task 3**: Evaluate **therapeutic efficacy and toxicity of EBRT and Alphatherapy**

2 - Acquire multimodal and multiparametric images during irradiation



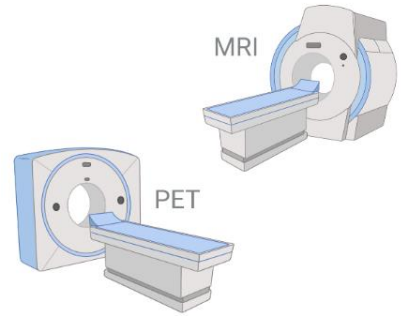
- **Tasks 1-8**: Measure a set of **tumour features by imaging**
- **Task 9**: Assess **the tumour absorbed dose** during irradiations

3 - Develop and implement a predictive model



- **Task 1**: Establish the **predictive radiomics model**
- **Tasks 2-3**: Extract **imaging & biological data**
- **Tasks 4-5:** Multi-omic and multi-imaging integration **for virtual biopsies**

4 - Transfer the predictive model into the clinic



- **Task 1:** Implement the MRI parameters into clinical machines
- **Task 2:** Implement the predictive model in **clinical MRI**
- **Task 3:** Develop new PET radioligands for monitoring tumour response to irradiations

WP2

We selected 3 IRPs to change the patient's care pathway by a multilevel approach

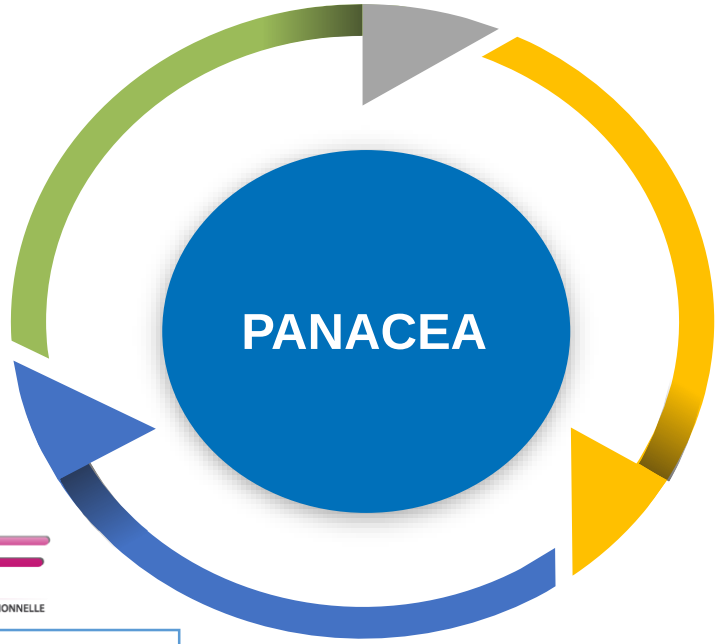
IRP-2

Changing preventive and supportive care strategies to reduce at-risk behaviours and treatment complications

From cancer primary prevention to post-treatment rehabilitation

A unique cluster of HSS researchers

Primary prevention, health education, onco-psychology, behavioural sciences, sport sciences, public health



Multidisciplinary clinical expertise

Supportive care, clinical nutrition, onco-psychology, adapted physical activity, addictology, medical cancer genetics

Cancer biology

Circulating biomarkers, oncometabolism, epigenetics

IRP-2

Two interventional research axes

1 - Adapt and disseminate theory-based interventions of cancer prevention

Task-1: Towards the general population

- In school children to reduce sun exposure
- In adults at work to promote physical activity

Gefluc
Les entreprises contre le cancer
Languedoc Roussillon

Task-2: Towards a cancer genetic-risk population

- Transfer theoretical tools of cancer prevention to target populations

2 - Introduce early supportive interventions to improve clinical benefit in cancer patients

Task-1: In GI cancers

- Early nutrition interventions
- Biomarkers of cancer cachexia

Task-2: In brain tumors

- To evaluate the effect of a mixed neuropsychological rehabilitation intervention in DLGG patients

Task-3: A digital application in oral therapies

- To help health professionals to prevent deleterious interactions between oral cancer therapies and complementary medicines

WP2

We selected 3 IRPs to change the patient's care pathway by a multilevel approach

Deciphering tumour metabolic cross-talks to design new anti-cancer therapies

IRP-3

Teams with international reputation in disciplines at the interface of metabolism and cancer biology

World-class research in cancer biology

Oncometabolism, epigenetics, epitranscriptomics, tumour microenvironment, immunity

Advanced computational sciences

Bioinformatics, machine learning, data modeling

Multidisciplinary clinical expertise

- Cutaneous melanomas, liposarcomas, gliomas, GI cancers, hemopathies
- Clinico-biological databases

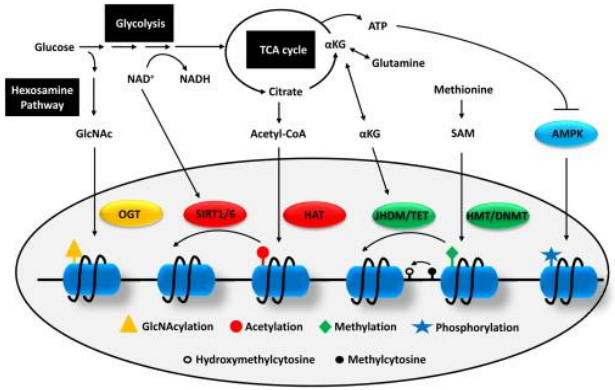
Cutting-edge core facilities

- Preclinical models
- Metabolomics
- Epitranscriptomics
- Imaging Mass Cytometry
- Antibody engineering
- Organoids

IRP-3

Three interconnected research axes

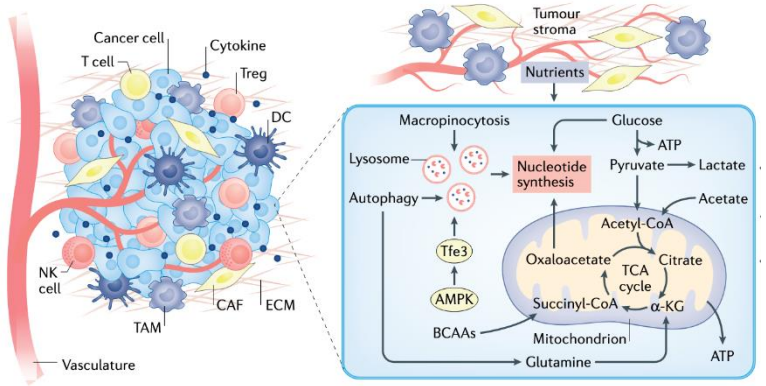
1 – Characterize molecular mechanisms linking metabolic changes to the epigenome and epitranscriptome



- **<u>Task 1:</u> Identify new biomarkers** of therapeutic responses and drug resistance in cancers with defined metabolic alterations

- **<u>Task 2:</u> Identify new therapeutic strategies** targeting metabolic and epigenetic changes

2 – Investigate how metabolic changes contribute to the cellular heterogeneity in the tumour ecosystem and to drug response

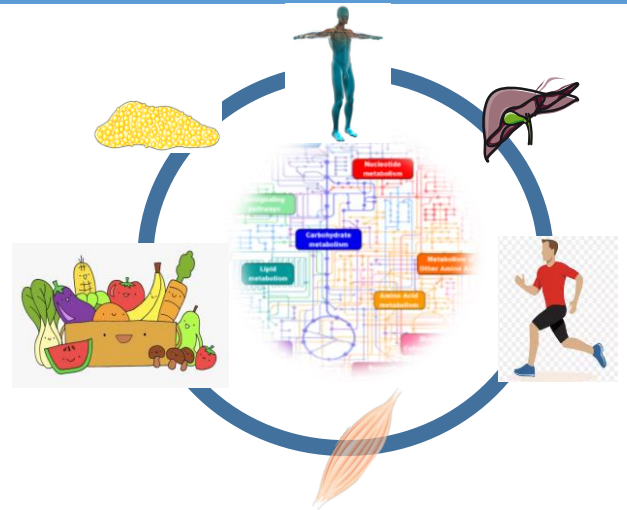


From Martinez-Reyel et al. Nat. Rev Cancer 2021

- **<u>Task 1:</u>** Evaluate the links between **metabolic heterogeneity and therapeutic responses**

- **<u>Task 2:</u>** Evaluate the **impact of metabolic changes on the efficacy of immunotherapies**

3 - Understand the metabolic crosstalks between tumour cells and their host

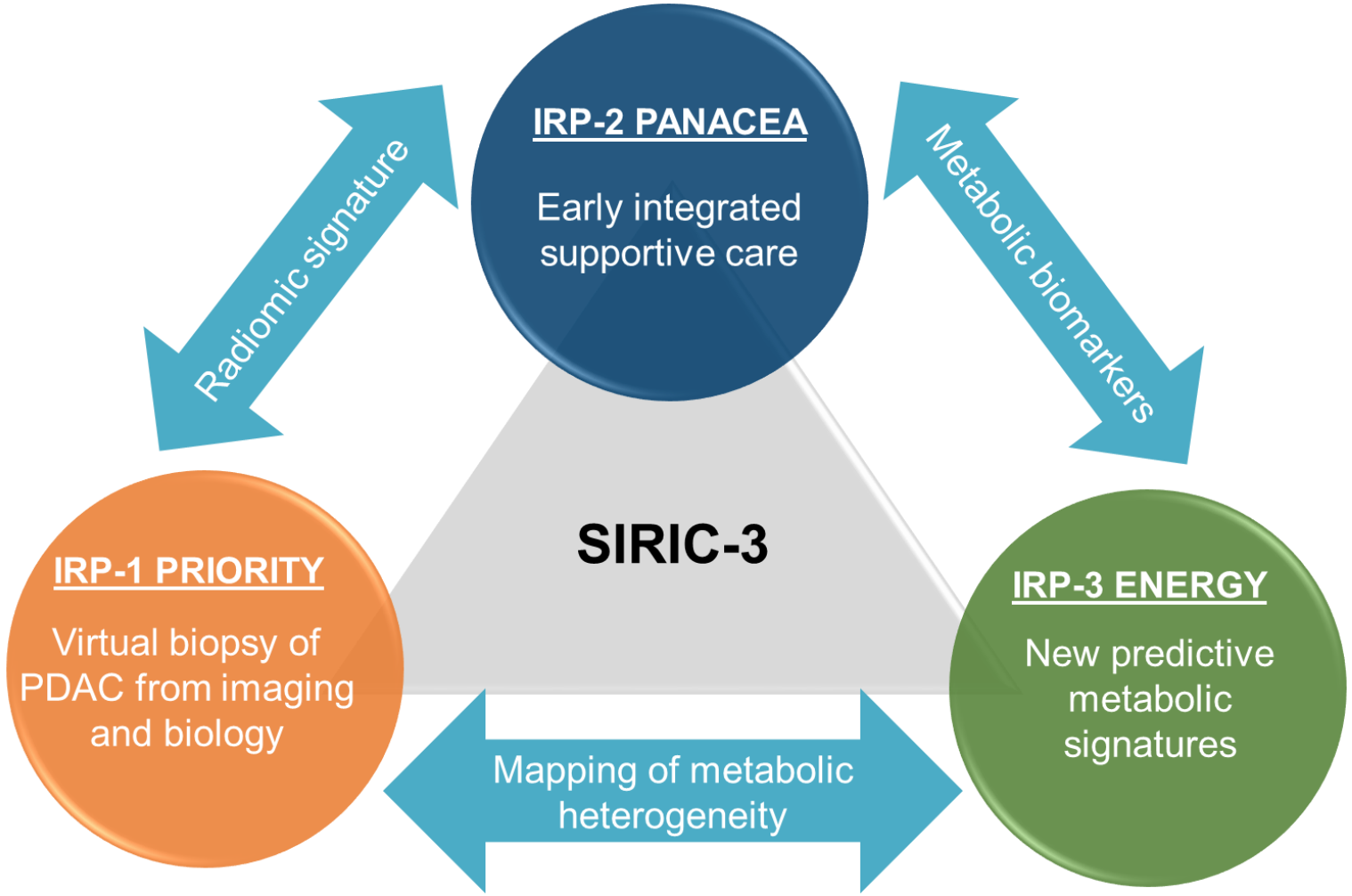


- **<u>Task 1:</u>** Investigate new mechanisms by which **cancer cells reprogram the metabolism of distant organs**

- **<u>Task 2:</u>** Explore the **effects of specific diets and adapted exercising on the metabolic reprogramming** of cancer cells

Example of cross-programmes synergies

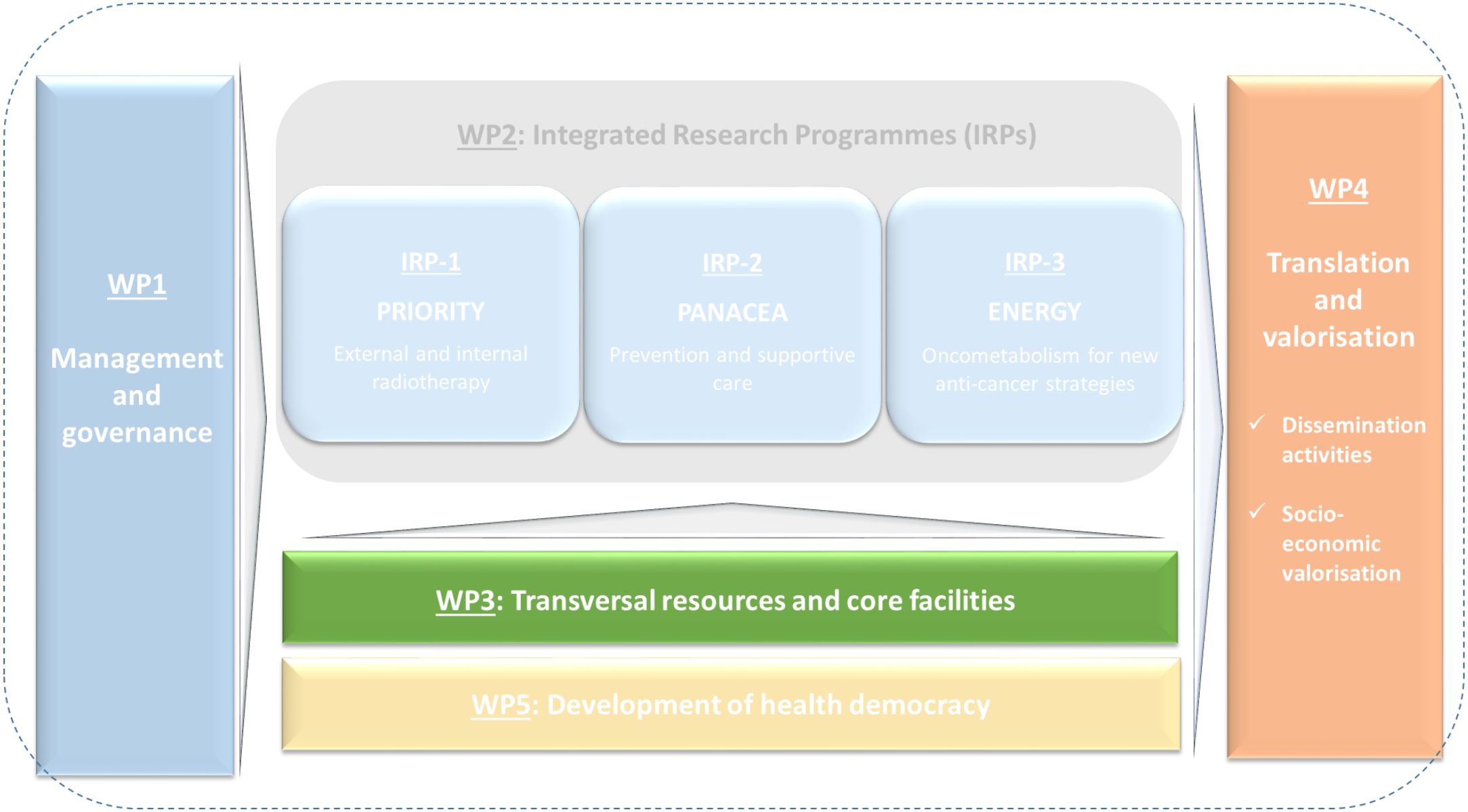
Biobank with clinical data



Change the patient's care pathway of pancreas cancer by a multilevel approach

SIRIC MONTPELLIER CANCER
Site de Recherche Intégrée sur le Cancer

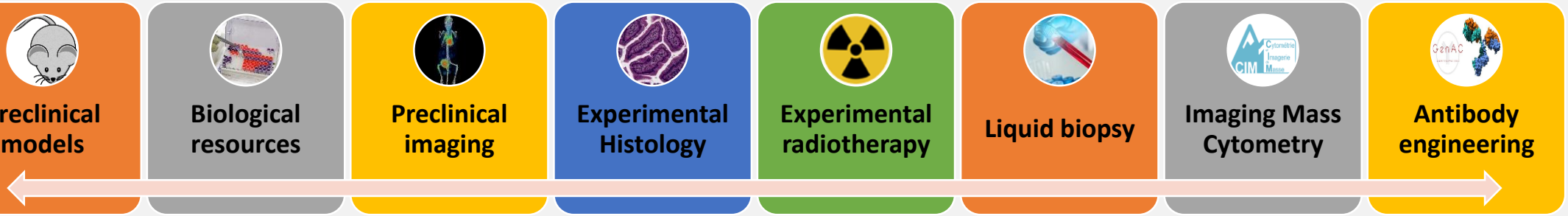
Strategic action plan



WP3 Optimise transversal resources and core facilities for IRPs

SIRIC MONTPELLIER CANCER
Site de Recherche Intégrée sur le Cancer

An existing tool-box for preclinical & translational research



Priority actions as part of SIRIC-3			
Spatial molecular imaging	Experimental 3D-guided radiotherapy	α-particles emitters therapy with radiomics	AI-based radiomics platform for MRI

αKen MEDICAL

THERAPANACEA

SIRIC MONTPELLIER CANCER
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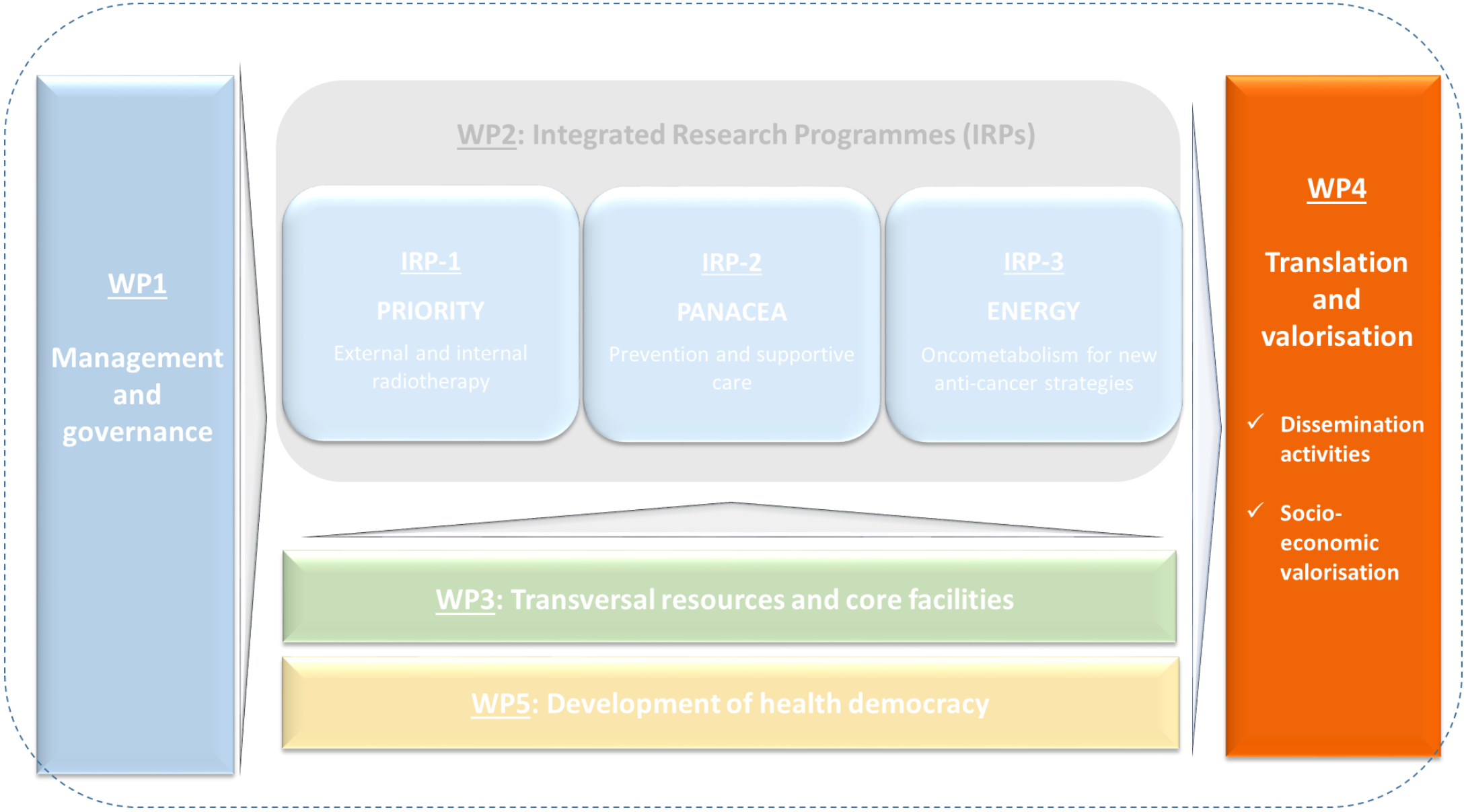


WP4 Promote knowledge and practices dissemination

❑ For professionals

Via academic networks

- **Onco-Occitanie, expert networks**

Promoting High-level scientific events

- **Montpellier Oncology Innovation Symposium** (6-7 Jul-2023)
- **10th International Symposium on Auger Processes** (6-8 Sept-2023)
- **National Congress on Cancer Prevention** (Sept-2023)
- **Annual SIRIC Meetings**

Improving training and education

- **Masters** : cancer biology, health psychology, Radio-TRANSNET
- **University Diplomas:** translational research, supportive care, nutrition in oncology

❑ For patients and the general public

- **Epidaure:** a unique tool for prevention and health education (Via Occitanie Agency of Health based in Montpellier)
- **Federating a network of patient associations**
- **Creating educational videos, booklets, events**

http://montpellier-cancer.com

WP4 Boost tech transfer and industrial partnerships

Relies on a powerful innovation ecosystem in oncology

- A broad spectrum of industry partnerships
- A strong commitment to host companies on campus
- Network of efficient technology transfer tools
- Oncology Innovation Transfer Centre (CTIO, by 2024)

A fertile ground for the dissemination and exploitation of SIRIC research

Eurobiomed

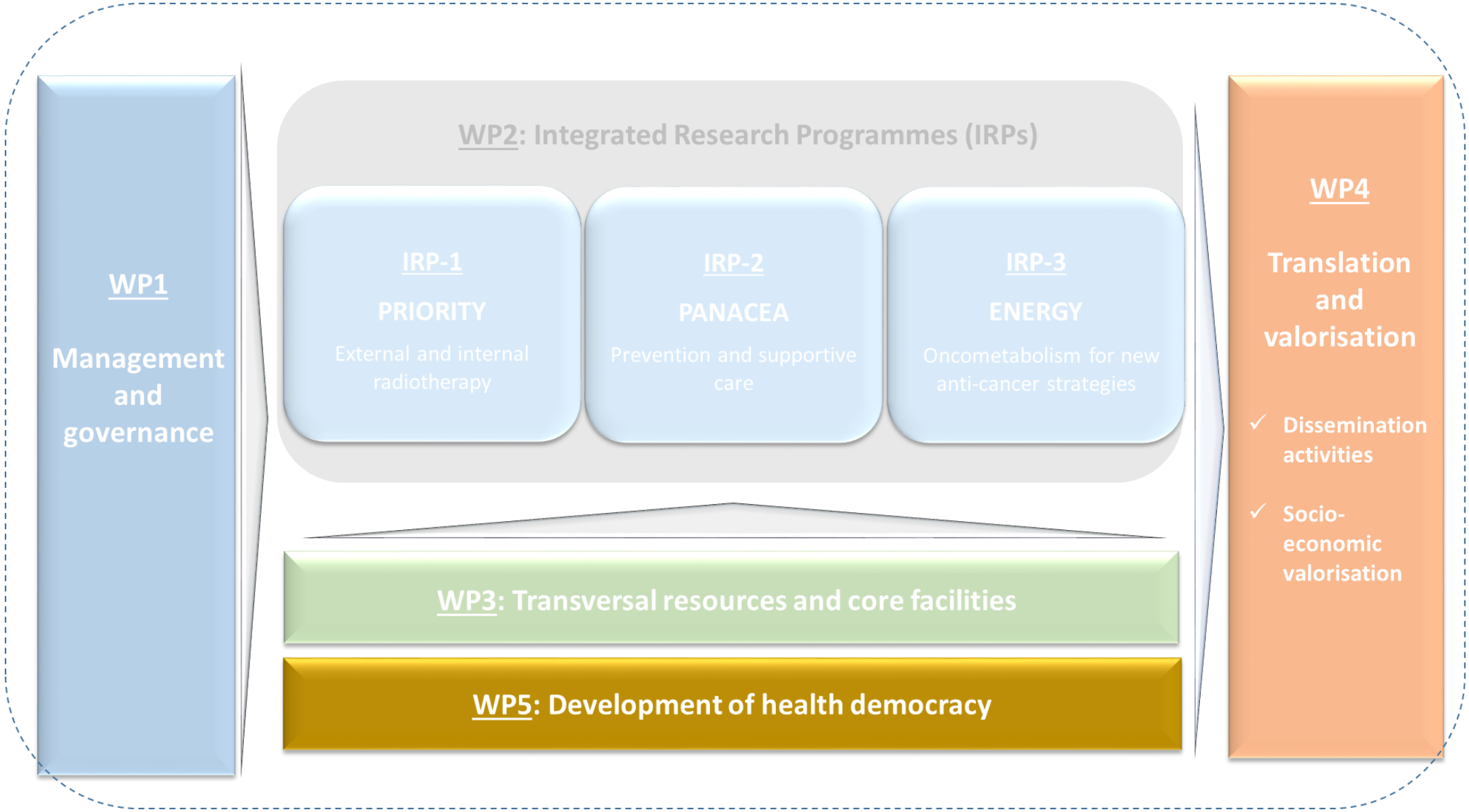
AXLR SATT

Université Montpellier

MEDVALLÉE MONTPELLIER

SIRIC MONTPELLIER CANCER
Site de Recherche Intégrée sur le Cancer

Strategic action plan



WP5 Pursue health democracy development

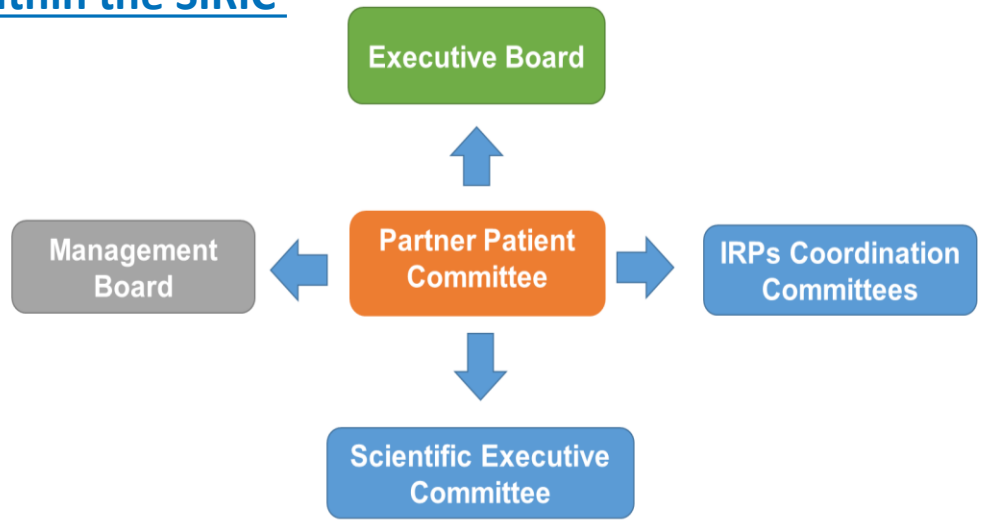
2 partner patients to coordinate SIRIC health democracy policy

Maguy Del Rio
Coordinator patient at ICM and new member (nov 2022) of the INCa national committee

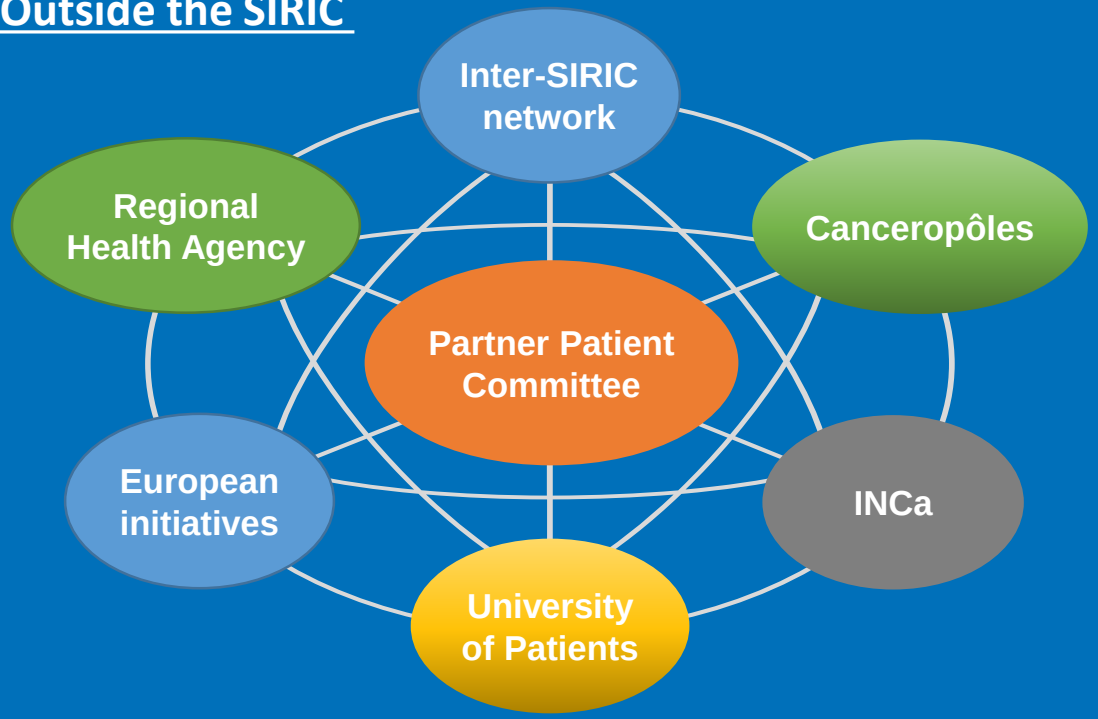
Cyril Sarrauste de Menthière
"Mon Réseau Cancer colorectal" Association
Executive Board of the "Digestive Cancers Europe" Association

Guarantee the integration of the « patient experience » into SIRIC projects

Within the SIRIC



Outside the SIRIC



Targeted actions

- Set-up a **Partner Patient Committee**
  - ❖ At all levels of SIRIC actions
  - ❖ Linked to regional, national and international initiatives
- Develop the **patient-researcher partnership** through IRPs
- Involve patients in **knowledge dissemination strategy**
- Lead an **inter-SIRIC network of partner patients**

Inter-SIRIC Colorectal Cancer Meeting (March 2022, Montpellier)

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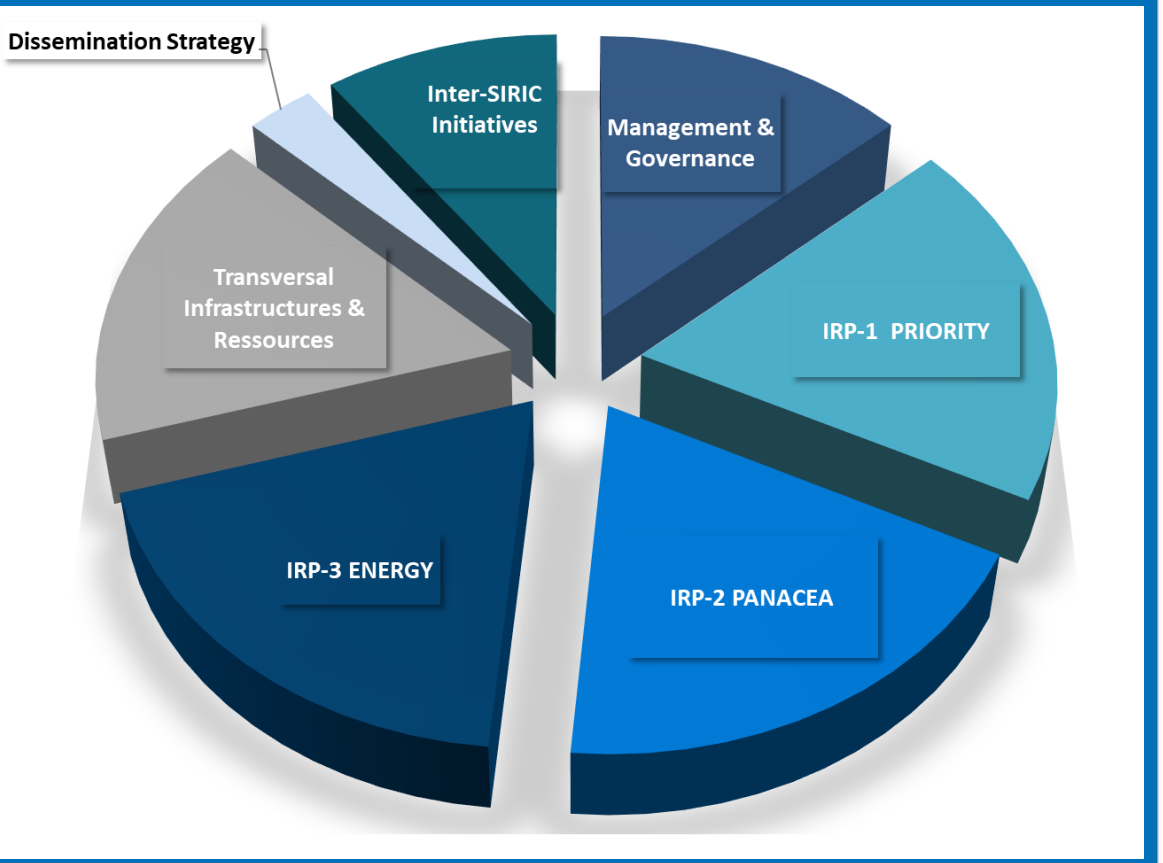
Provisional budget 2023-2027



- Grant centrally managed by ICM Finances Dept.

- **Total budget 6M€**
  - 3420k€ (57%) for the 3 Programmes
  - 1000k€ (17%) for transversal resources
  - 175k€ (3%) for dissemination activities
  - 600k€ (10%) for inter-SIRIC initiatives
  - 805k€ (13%) for management and general administration

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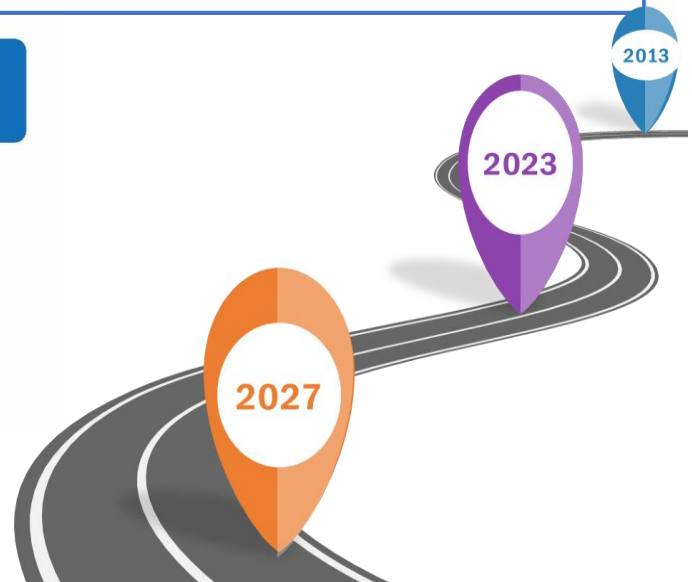
« Practice-changing » SIRIC

To change the patient's care pathway by a multilevel approach

SIRIC MONTPELLIER CANCER
Site de Recherche Intégrée sur le Cancer

Leverage **a unique cluster of excellence in internal and external RT** to provide **game-changing management of targeted irradiation treatments**

Establish a **highly competitive research network** targeting **oncometabolism as a source of new therapeutic strategies**



Capitalize on **strong expertise in HSS interventional research to demonstrate efficacy of prevention and early supportive care**