

# European Initiative to UNderstand CANcer (UNCAN.eu)

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*Towards the creation of unique digital platform  
where researchers from all over the world  
share and have access to high-quality cancer research data*



# Cancer Mission: Implementation plan

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HORIZON-MISS-2021-  
UNCAN-01-01  
**Preparing UNCAN.eu, a  
European initiative to  
understand cancer**



## **Establish the 'UNCAN.eu' platform**

a unique digital platform where researchers from all over the world share and have access to high-quality cancer research data.

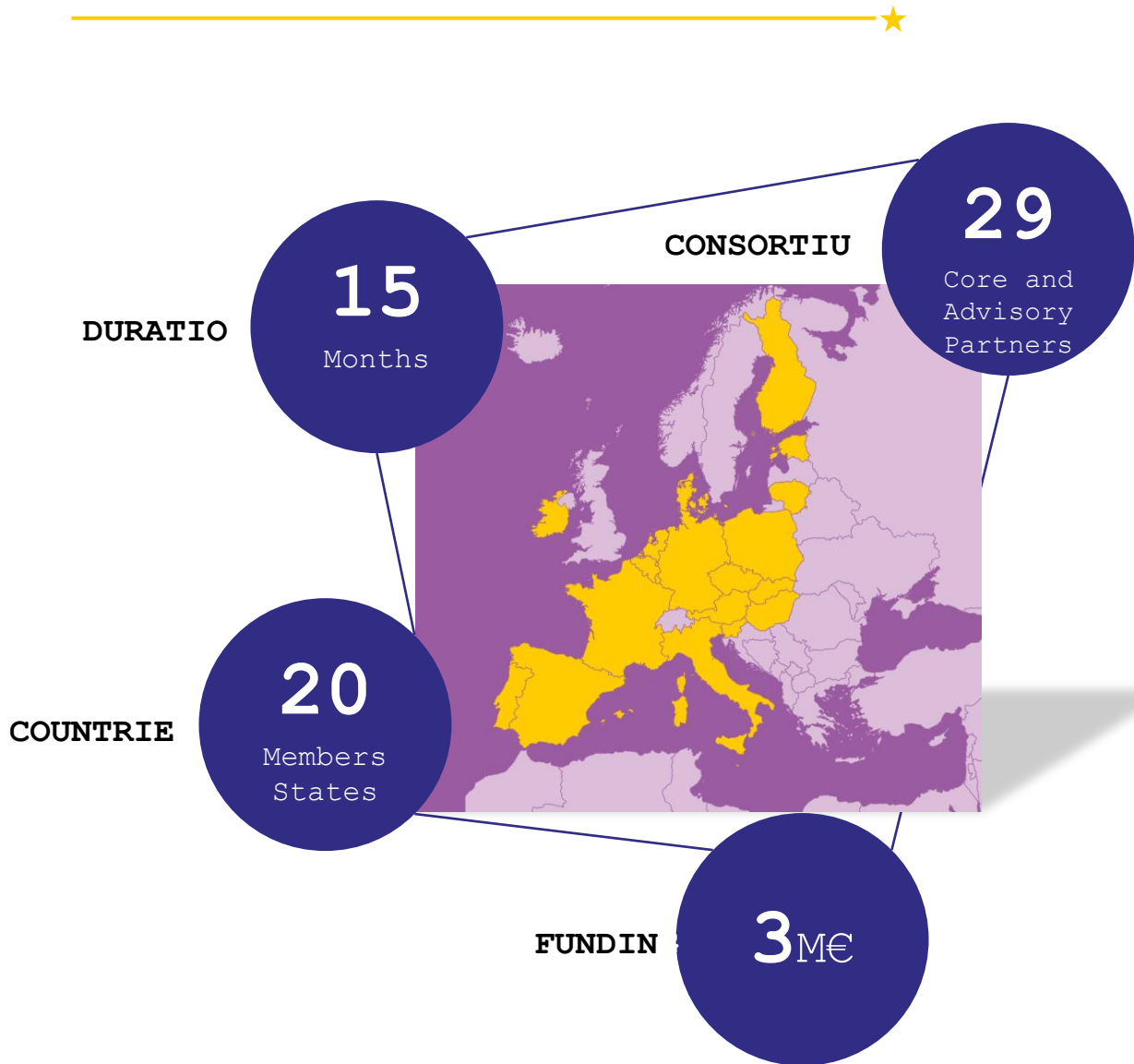
A Coordination and Support Action (CSA)

## **will develop a blueprint**

in order to prepare

- a fully-fledged,
- sustainable platform
- managed by Member States, associated countries & stakeholders.

# OVERVIEW



## CORE PARTNERS

Inserm

Alliance Against Cancer

Biomedical Research Networking Center

Childhood Cancer International Europe

European Cancer Patient Coalition

European Society for Paediatric Oncology

German Cancer Research Center

Organisation of European Cancer Institutes - EEIG

Netherlands Cancer Institute Antoni Van Leeuwenhoek

National Institute of Oncology Hungary

Oncode Institute

Vall d'Hebron Institute of Oncology

InsermTransfert

Institut National du Cancer

International Agency for Research on Cancer

# AMBITION

September 1, 2022

November 30, 2023

4 . UNCAN . eu

UNCAN . eu

A Coordination and  
Support Action

Blueprint  
(sustainability,  
governance)

1

2

3

4

European  
Federated  
Cancer Research  
Data hub.

Use cases

Address inequalities

Patients,  
Patient advocates  
Citizens

# creating a FEDERATED CANCER RESEARCH DATA HUB

fed with  
RESEARCH  
USE CASES

involving  
PATIENT ADVOCATES  
EU CITIZENS

📍 solving 📍  
INEQUITIES BETWEEN  
MEMBER STATES



**H**eidelberg

EFCRDH



**February**

2023

**1. Why** does it need a European Cancer Research Data Hub?

How to synergize UNCAN.eu with ongoing initiatives launched by the EC ?

Do we need both existing and newly generated data?

What would be the role of existing infrastructures (ERICs)?



This project has received funding from the European Union's Horizon Europe Coordination and Support Actions programme under grant agreement No 101069496

Heidelberg

EFCRDH



February

2023

**1. Why** does it need a European Cancer Research Data Hub?

How to synergize UNCAN.eu with ongoing initiatives launched by the EC ? **YES, especially EOSC4Cancer & EUCAIM**

Do we need both existing and newly generated data? **YES, we need newly generated data**

What would be the role of existing infrastructures (ERICs)? **ELIXIR to manage data, other to connect to use cases**



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February

2023

**2. What type of data** should be included in a Research Data Hub (in the short and long term)?

Should we start with typical medical data (clinical annotation, omits, images) and subsequently implement new types of databases (lifestyle, other missions)?



or

Should we implement all types of data simultaneously, based on scientific projects?



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**February**

2023

**2. What type of data** should be included in a Research Data Hub (in the short and long term)?

Data of all types should be implemented according to scientific projects in use cases?



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February

2023

**3. How can a European Cancer Research Data be built?** Which initiatives can the Data Hub built upon?

Do you agree with a federated (GDPR) / centralized (non-GDPR) mixed model of organisation? ★

What about one National Hub per Member State, per EU Region?

How many existing national hub can we already identify?



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February

2023

**3. How can a European Cancer Research Data be built?** Which initiatives can the Data Hub built upon?

Do you agree with a federated (GDPR) / centralized (non-GDPR) mixed model of organisation? **YES, to explore** ★

What about one National Hub per Member State, per EU Region? **YES, per Member State ideally**

How many existing national hub can we already identify? **None does really exist**



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#### 4 . What are legal and ethical frameworks to consider when establishing a Cancer Research Data Hub?

We need a rapid data access, what about the obstacles to give a centralized authorization for data access? `



What would be the legal framework to do that? Could we start working on that aspect?



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## 4 . What are legal and ethical frameworks to consider when establishing a Cancer Research Data Hub?

Build on

- EOSC4 Cancer experience in colorectal cancer
- EHDS
- ECPDC?



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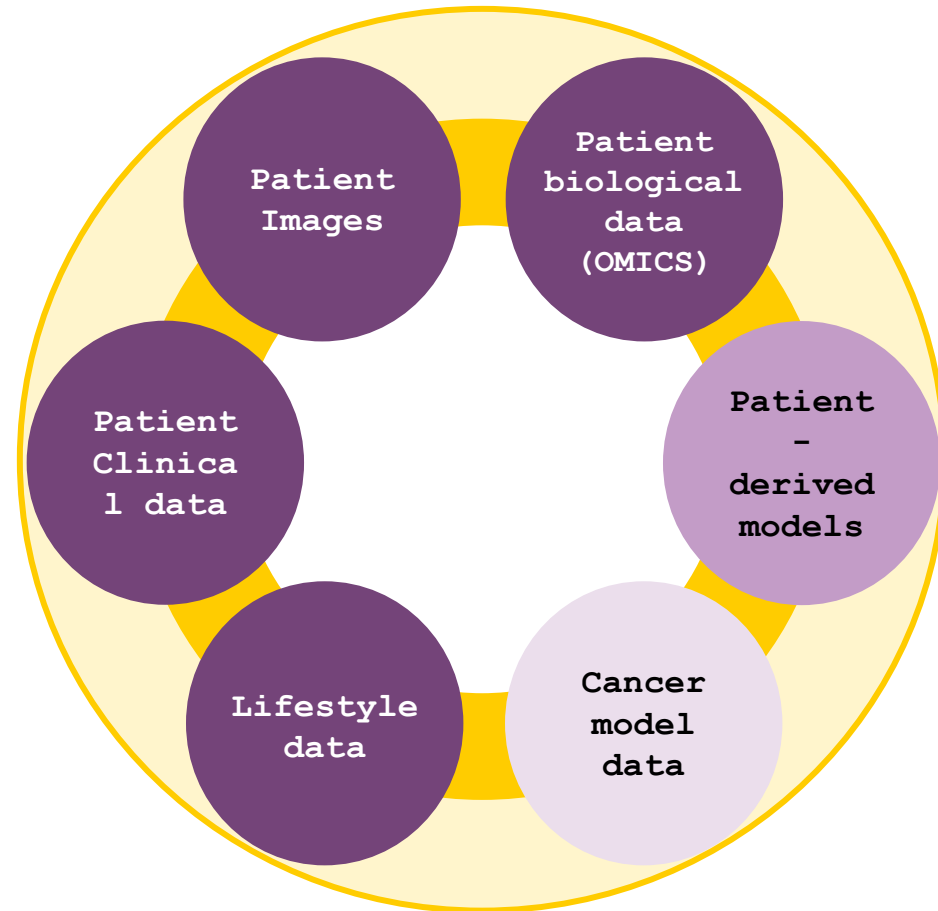
# Focus on the future UNCAN.eu

## platform

WP3

### Data hub

A unique collection of  
cancer research data  
worldwide



# Focus on the future UNCAN.eu

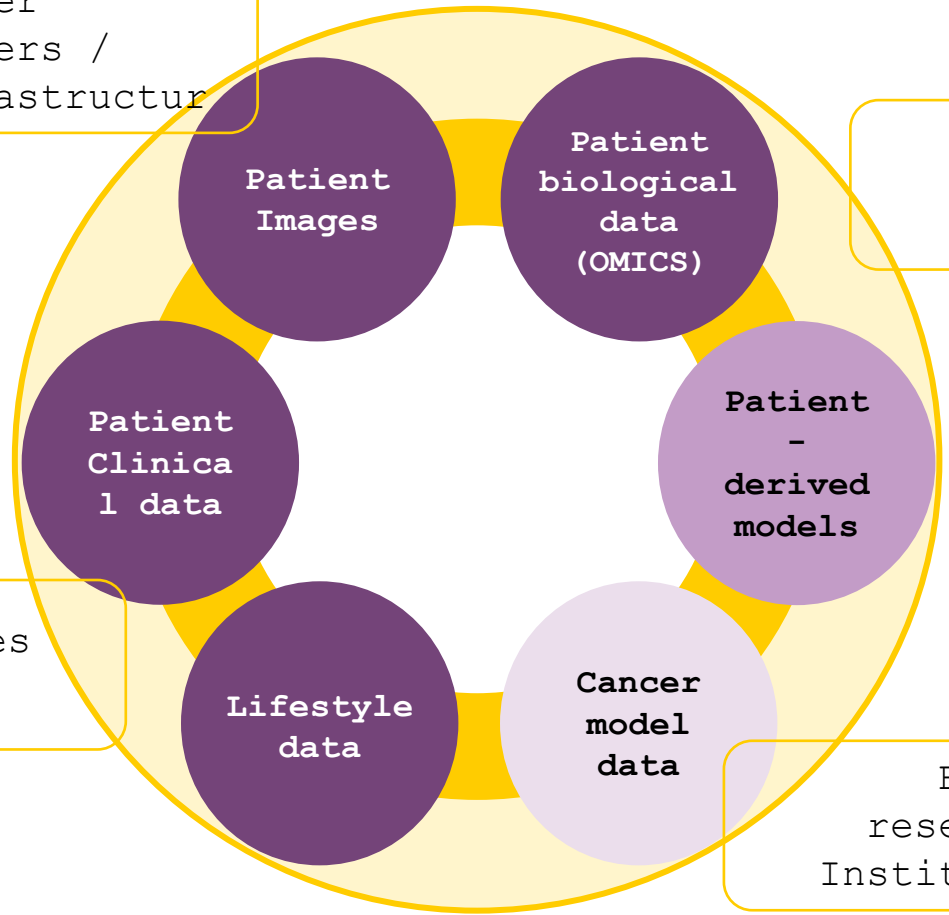
## platform

WP3

### Data hub

A unique collection of cancer research data worldwide

Comprehensive cancer centers / infrastructures



University Hospitals

Registries Exposome

Basic research Institutes

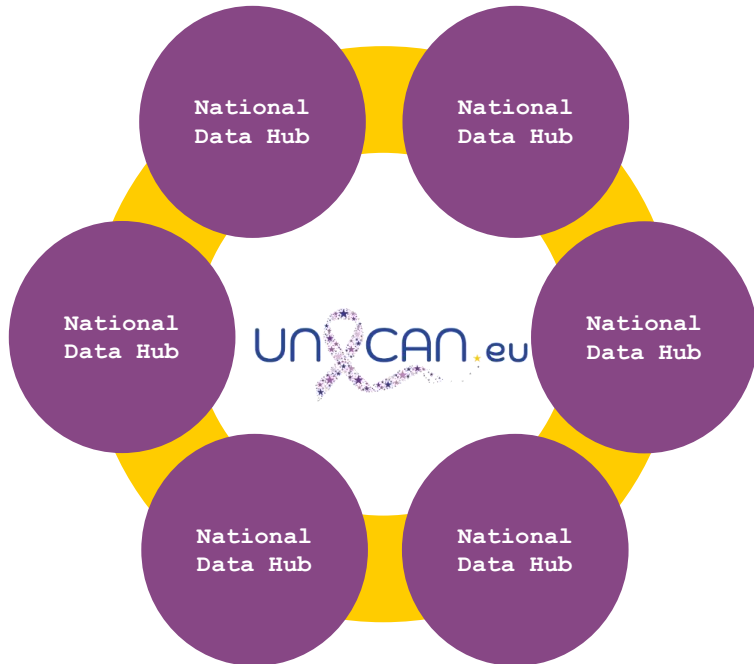
# Focus on the future UNCAN.eu platform

WP3

Data hub - 2 complementary organizations

## A federated Data Hub

Patient data  
GDPR



Two models  
and  
Two types of  
operation GDPR  
non-GDPR

## A centralized Data Hub

Research models  
Non-GDPR

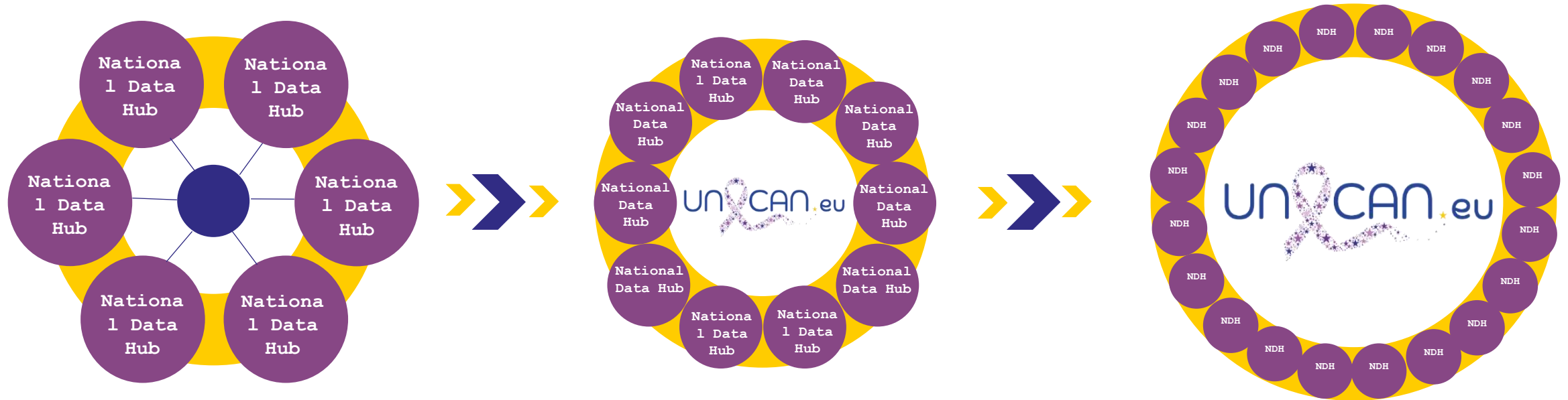




# Focus on the future UNCAN.eu platform

WP3  
WP5

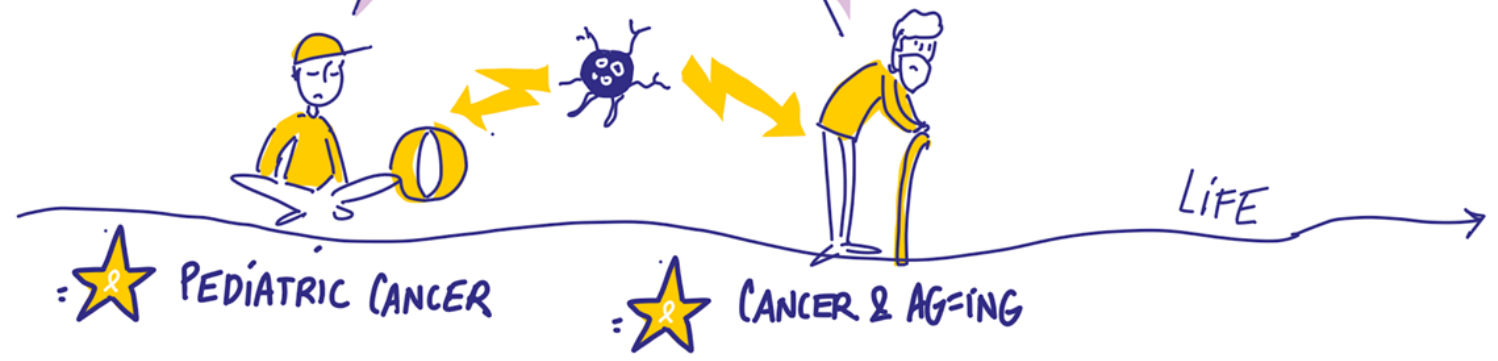
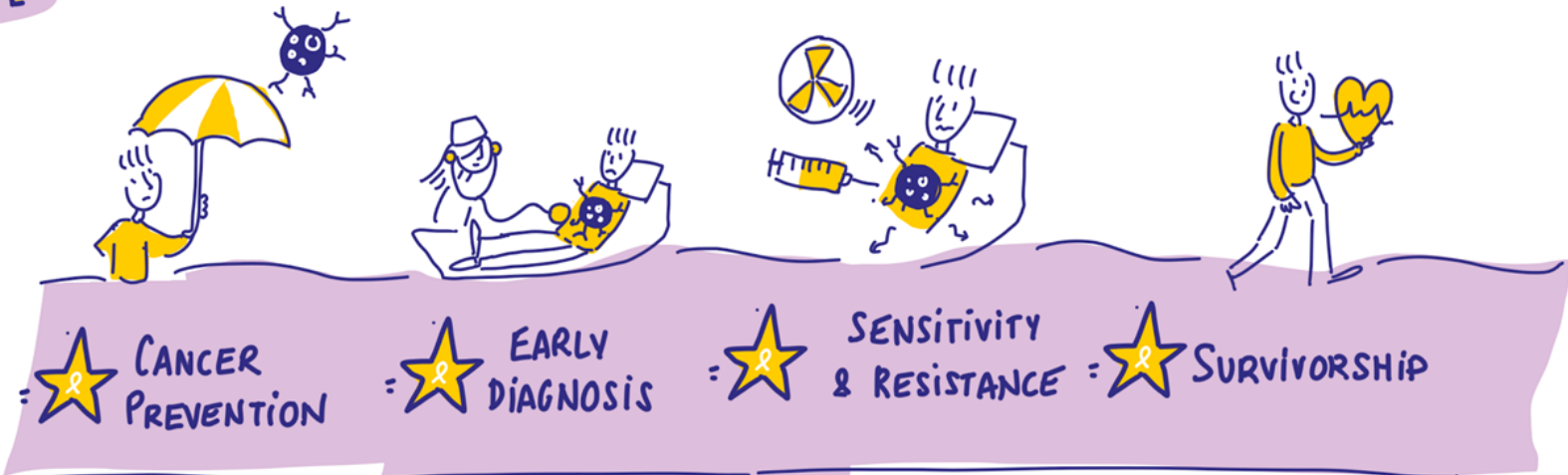
A stepwise building model



*Delegation of National Hubs to UNCAN.eu  
to give cancer researchers the access to data*



# 6 AREAS of CANCER RESEARCH CHALLENGES



# Definition of use cases

WP2

A Delphi process launched in 2022



**B**arcelona

Use cases, part 1



**March**  
2023

**R**oma

Use cases, part 2



**May**  
2023



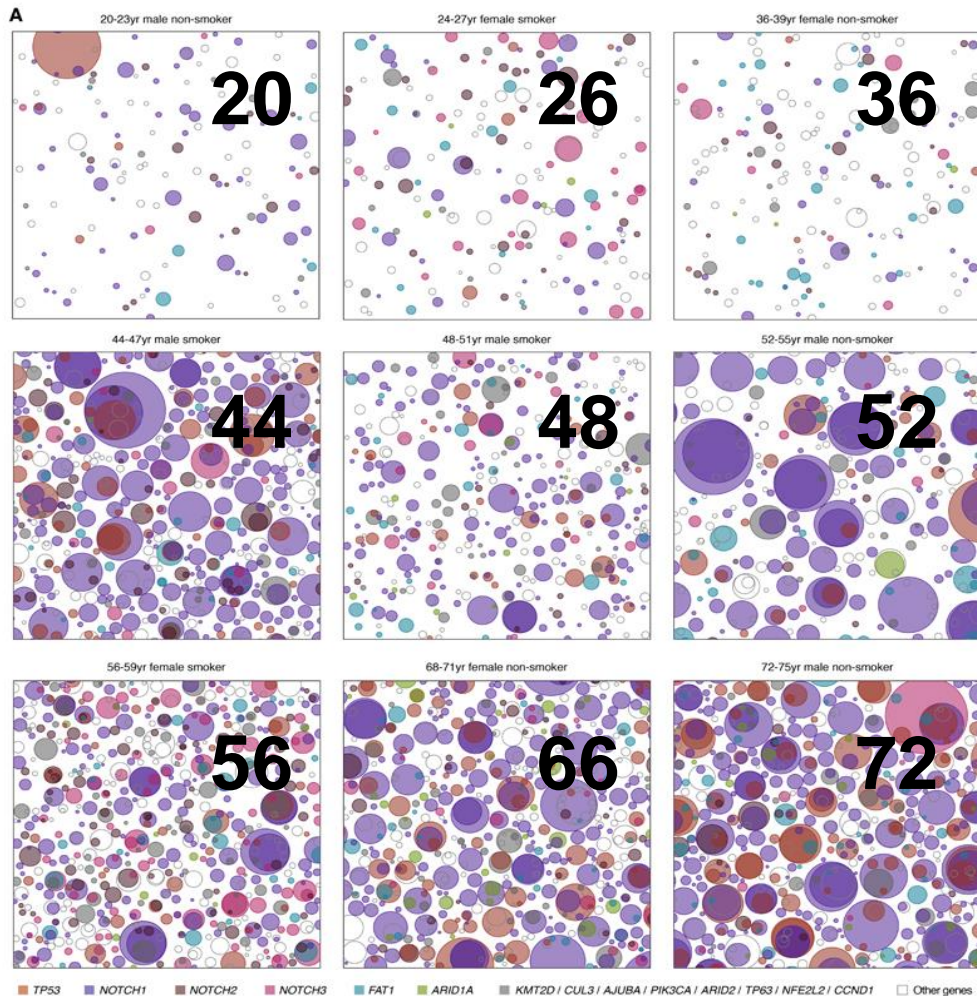
Questions to address?

Data to generate or collect?

Potential intervention to explore?

e.g., Cancer  
and ageing★

# Ageing impact on cancer installation and progression<sup>★</sup> ?



Genetic mosaicism increases with ageing

- Could we improve our understanding of ageing-induced cancer ?
- Could we connect the results to prevention, early diagnosis and interception strategies ?

# Ageing impact on cancer care ?

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Could we measure the pace of ageing,  
e.g., by measuring biological age  
in a blood sample?

Could we detect  
which organ(s) contribute(s) to age-related changes?

Could we use such approaches  
to adapt therapeutic strategy and objectives  
to biological age?



## Undulating changes in human plasma proteome profiles across the lifespan

Benoit Lehallier<sup>1,2,3\*</sup>, David Gate<sup>1,2,3,4</sup>, Nicholas Schaum<sup>5</sup>, Tibor Nanas<sup>1,2,3,6</sup>, Song Eun Lee<sup>1,2,3,4</sup>, Hanadie Yousef<sup>1,2,3,4</sup>, Patricia Moran Losada<sup>1,2,3</sup>, Daniela Berdnik<sup>1,2,3,4</sup>, Andreas Keller<sup>7</sup>, Joe Verghese<sup>8,9</sup>, Sanish Sathyan<sup>8,9</sup>, Claudio Franceschi<sup>10,11</sup>, Sofiya Milman<sup>8,12</sup>, Nir Barzilai<sup>8,12</sup> and Tony Wyss-Coray<sup>1,2,3,4\*</sup>

### Article

## Ageing hallmarks exhibit organ-specific temporal signatures

<https://doi.org/10.1038/s41586-020-2499-y>

Received: 5 June 2019

Accepted: 7 May 2020

Published online: 15 July 2020

Check for updates

Nicholas Schaum<sup>1,2,3\*</sup>, Benoit Lehallier<sup>2,3\*</sup>, Oliver Hahn<sup>2,3\*</sup>, Róbert Pálovics<sup>2</sup>, Shayan Hosseinzadeh<sup>3</sup>, Song E. Lee<sup>2</sup>, Rene Sit<sup>3</sup>, Davis P. Lee<sup>2,4</sup>, Patricia Moran Losada<sup>2</sup>, Macy E. Zardeneta<sup>2,4</sup>, Tobias Fehlmann<sup>5</sup>, James T. Webber<sup>2</sup>, Aaron McGeever<sup>3</sup>, Kruti Calcuttawala<sup>2</sup>, Hui Zhang<sup>2</sup>, Daniela Berdnik<sup>2</sup>, Vidhu Mathur<sup>2</sup>, Weilun Tan<sup>3</sup>, Alexander Zee<sup>3</sup>, Michelle Tan<sup>3</sup>, The Tabula Muris Consortium\*, Angela Oliveira Pisco<sup>3</sup>, Jim Karkanas<sup>3</sup>, Norma F. Neff<sup>2</sup>, Andreas Keller<sup>2,5</sup>, Spyros Darmanis<sup>3</sup>, Stephen R. Quake<sup>2,6,8,9</sup> & Tony Wyss-Coray<sup>2,4,7,8,9</sup>

Ageing is the single greatest cause of disease and death worldwide, and understanding the associated processes could vastly improve quality of life.

# Cancer treatment impact on ageing?

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Could we prevent accelerated aging induced by cancer treatment?



Key targets / pathways for therapeutic intervention are developed

1 – Insulin-like signalling pathway (IIS)

2 – Mammalian target of rapamycin (mTOR)

3 – Sirtuins (protein deacetylases NAD<sup>+</sup>-dependent)

4 – Mitochondria (respiration and oxidative stress)

5 – Senescent cells

# UNCAN.eu platform



WP2

From use cases to artificial  
intelligence

Research  
**Use  
cases**

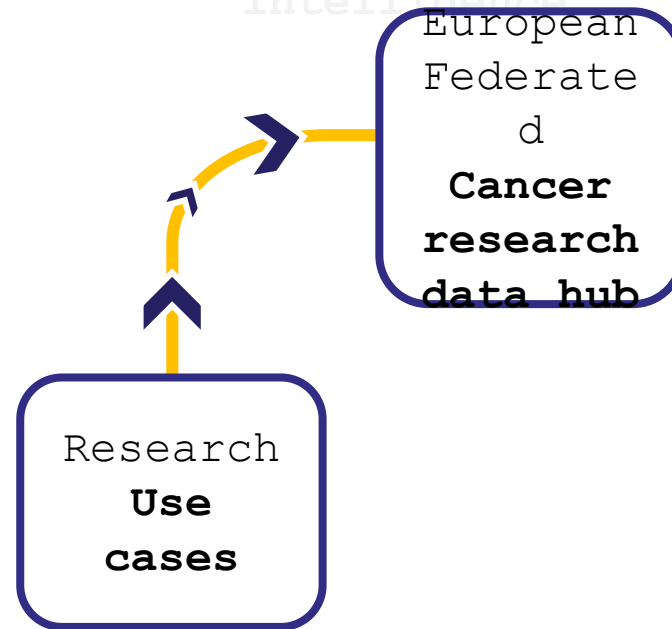


# UNCAN.eu platform

WP2

From use cases to artificial

intelligence

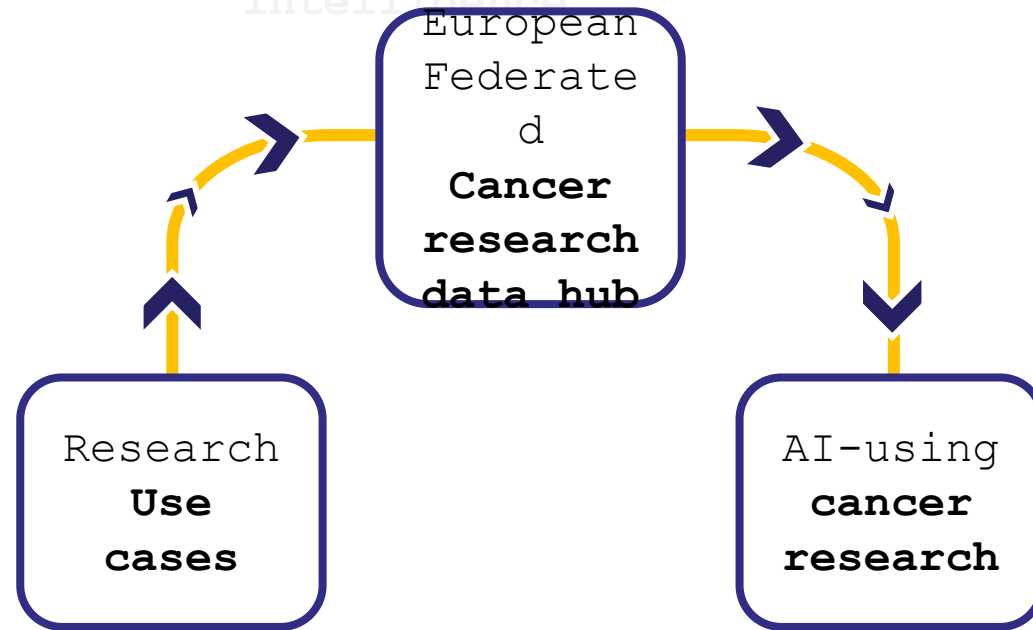


# UNCAN.eu platform

WP2

From use cases to artificial

intelligence

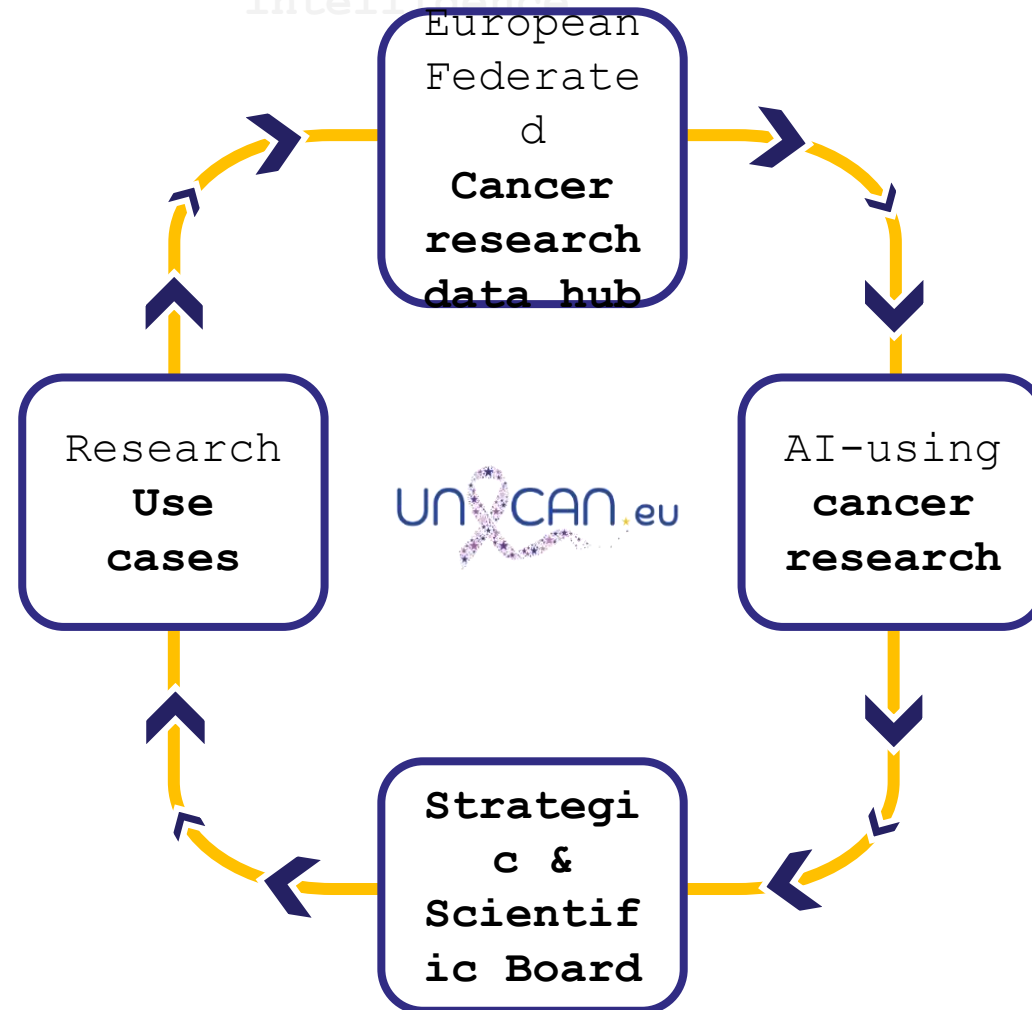


# UNCAN.eu platform

WP2

From use cases to artificial

intelligence





2025      2026      2027      2028      2029      2030      2031      2032      2033      2034

**USE CASES**

**USE CASES**

**USE CASES**

**USE CASES**

Serial calls: at least 3  
every other year

National Hubs  
UNCAN.eu



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# UNCAN.eu governance

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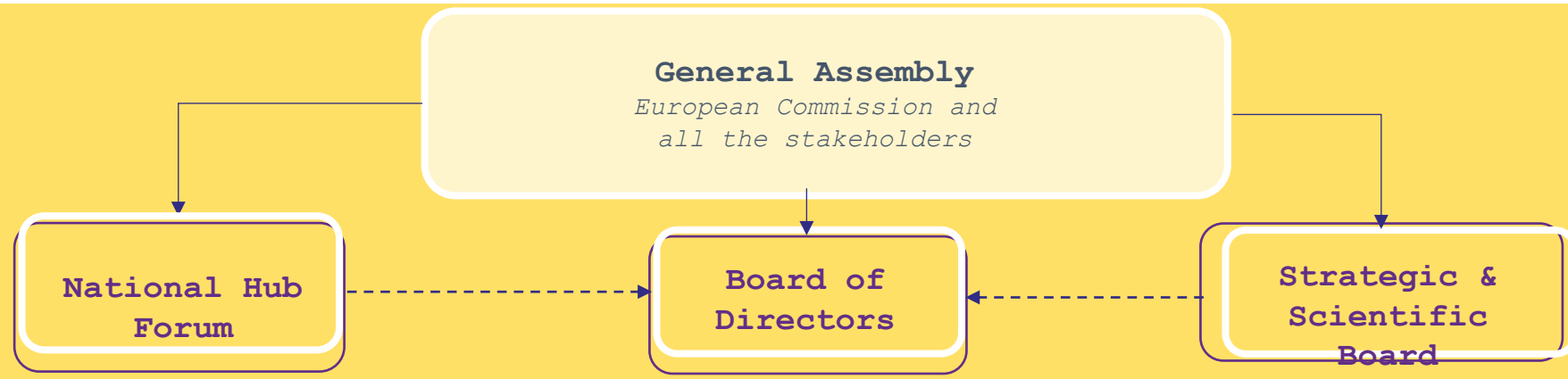
## 5 *Data hub governance*

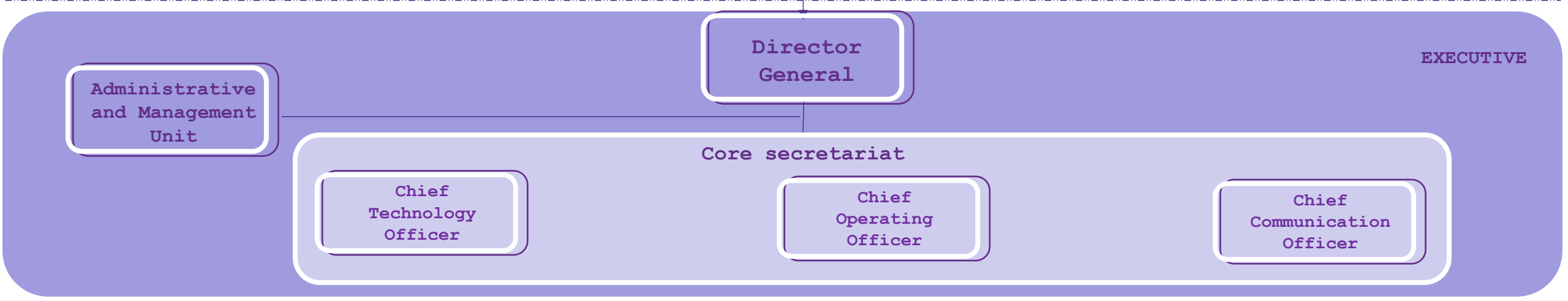
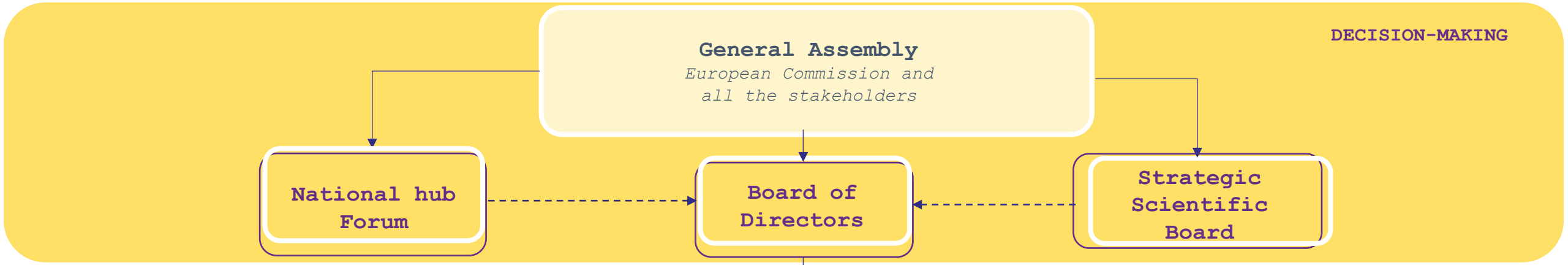


Third party partners

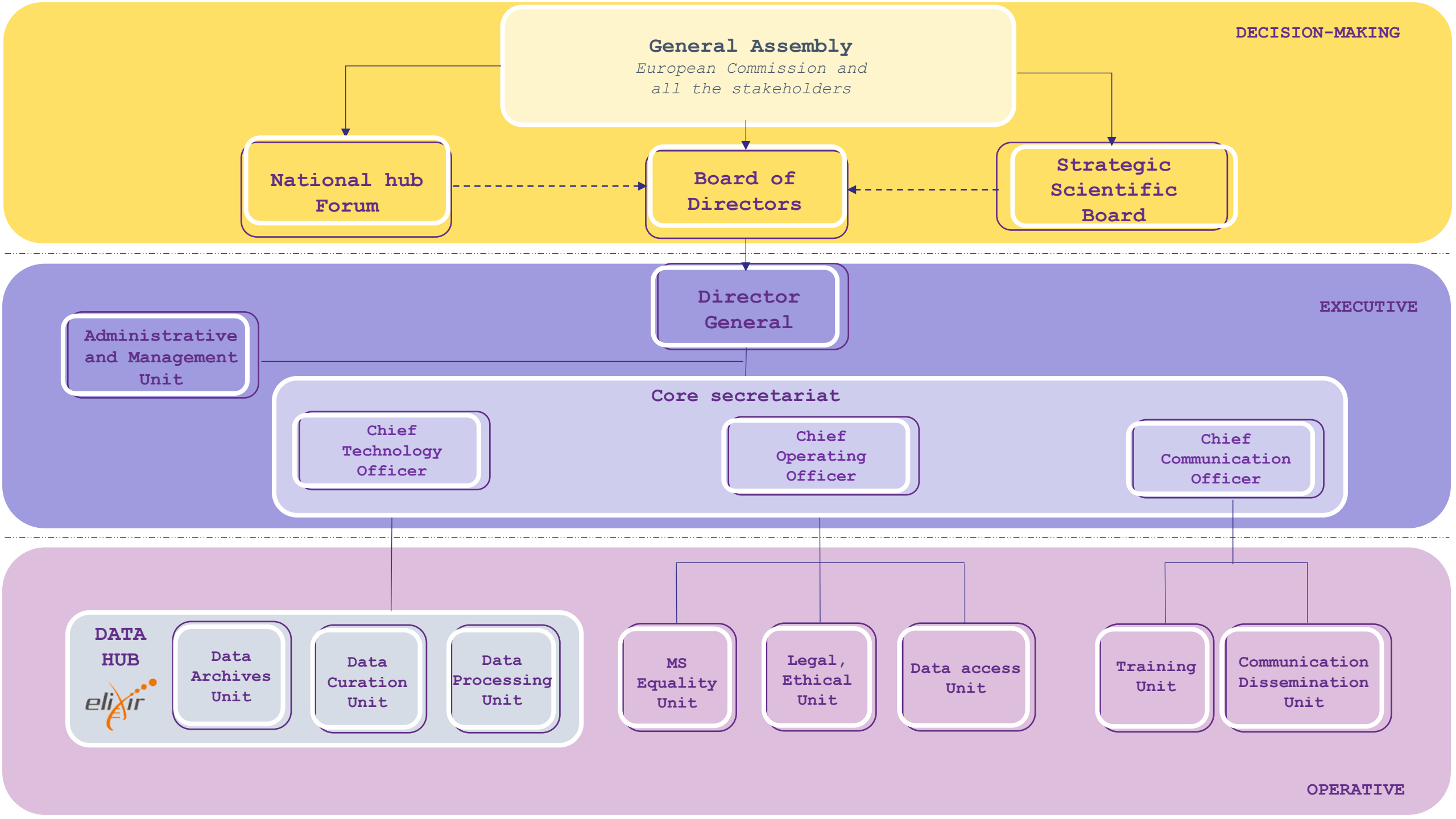


Private  
Partners





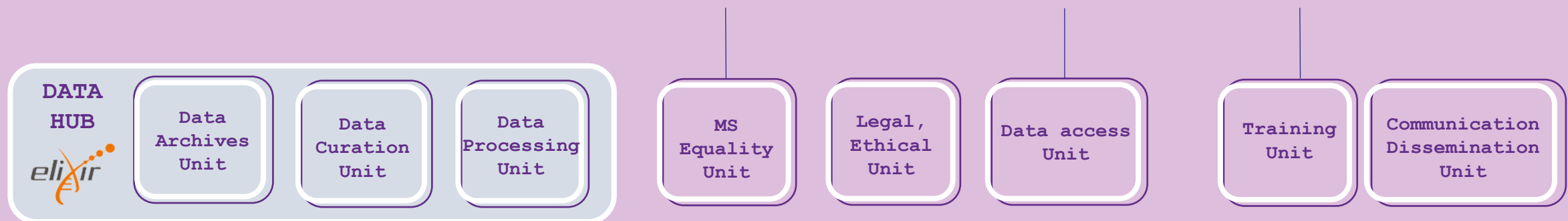




# UNCAN.eu governance

5

## Operative units



OPERATIVE

- Persistent infrastructure
- Data quality Control
- Data ingestion
- Cross data modalities
- Remote access
- Security
- Upgrades

- Standardisation
- Harmonisation
- Alignments
- Tracking of patient trajectories

- Metadata-driven discovery
- Query systems
- Data catalogs
- Beacon systems
- Workflows
- Software analytics

- Twinning Programs
- Technology transfert
- Continuous evaluation

- Legal aspects
- Ethical aspects
- Centralized access
- Secure access

- Data access requirements verification
- ...

- Analysis tools
- Workspaces
- Catalogs

- Publications
- Website
- Newsletter
- Social networks
- Licenses

# Patients and European Citizens in cancer research

WP4

## Empowering patients and citizens

### Educate

- Communication (website, social media)
- Educational material (Testimony videos Educational toolbox)

### Advocate

- Surveys
- Political support
- Governance



European Cancer Patient Coalition



Childhood Cancer International  
**EUROPE**

# Towards a high-quality cancer research across all Europe

WP6

## Reducing inequalities

among MS

Identification  
of cancer  
research gaps

- Access to resources (benchmarking, KPI)
- Epidemiological data



International Agency for Research on Cancer



# Towards a high-quality cancer research across all Europe

WP6

## Reducing inequalities

among MS

Identifica  
tion of  
cancer  
research  
gaps

- ❑ Access to resources (benchmarking, KPI)
- ❑ Epidemiological data

Solutions

- ❑ Twinning programs
- ❑ Technology transfer
- ❑ Adapted research programs



International Agency for Research on Cancer



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where researchers from all over the world  
share and have access to high-quality cancer research data*

