# တeosc cancer

## **EOSC4Cancer**

A European-wide foundation to accelerate Data-driven Cancer Research











European Health Data Space
European Cancer Mission

#### **Alignment**







#### **Open data standards**









#### **Stakeholders**













#### **EOSC4Cancer**

#### A European-wide foundation to accelerate Data-driven Cancer Research



- → EOSC4Cancer as provider of the infrastructure for the exploitation of cancer data for the EU Cancer Mission.
- → EOSC4Cancer brings together comprehensive cancer centres, research infrastructures, leading research groups, and major computational infrastructures across Europe to make the exploitation of the data possible.
- → EOSC4Cancer will prepare **EOSC services** for cancer research and enrich EOSC with data, tools and services from the cancer community.
- → Start: 1 September 2022 (30 months)
- → Consortium: 28 full beneficiaries, 1 associated partner & 5 affiliated entities.

### Partners, associates, and affiliated entities





































































## **Objectives**



- → Enable storage, access, sharing, analysis and processing of research data and other digital research objects from basic and clinical cancer research.
- → Mobilise, interconnect and interoperate datasets relevant in cancer research.
- → Make cancer research data and analysis systems accessible to basic and clinical scientists in the most used cancer analysis portals.
- → Integrate digital tools, data analytics and Artificial Intelligence/Machine Learning tools for the analysis of cancer data in the cancer analysis portals.
- → Contribute to the **European Health Data Space** (EHDS), the Horizon Europe **European Open Science Cloud** (EOSC) Partnership and the **Cancer Mission**

## **Expected Outcomes and Impact**



#### → Facilitate Cancer Research across Member States and Associated Countries

Result #1: A platform that will enable storage, sharing, access, analysis and processing of research data and other digital research objects from basic and clinical cancer research.

**Result #2: Mobilisation, interconnection and interoperation** of **datasets relevant in cancer research**. Contribute with protocols and operating procedures to facilitate the progressive adoption of the **FAIR principles** across data sources but also for research software.

Researchers, healthcare professionals, cancer patients, and survivors contributing to cancer research

Result #3: Cancer research data and analysis systems made easily accessible to basic and clinical scientists in open cancer analysis portals.

## **Expected Outcomes and Impact**



Result #4: Integrated digital tools, data analytics and Artificial Intelligence/Machine Learning methods for the analysis of cancer-related data in the cancer analysis environments.

→ Contribute to the Horizon Europe EOSC Partnership and other relevant partnerships related to cancer research.

Result #5: Roadmap for EOSC support to an European Cancer Data Space in the European Health Data Space (EHDS) in partnership with the Cancer Mission. Participation of patient/survivors associations in the project's Stakeholder forum and in the Scientific Advisory Board together with the Ethics Advisory Board.

## The patient journey









# **Diagnostics**Primary tumours



## **Treatment**Metastatic Cancers

#### **Cancer Registries**

- ► Cancer registries
- ► Environment (pollutants)
- ► Social data
- ► Geolocalisation

## Screening Programmes

- Screening programmes
- ► Medical imaging
- Medical data (EHR structured data)

#### Cancer Research

- ► Patient level: Genomics data, Imagin (digital pathology), and EHR data (structured data)
- ► Other research data: liquid biopsy, animal models, drug screening
- ► Non patient specific data: animal models, drug screening, etc

#### Clinical trials

- ► Cancer clinical trials (descriptors metadata)
- ► Patient level genomics and medical data
- ► Actionable data (regulated): markers, drugs, and treatments

Research Software for epidemiological level analysis

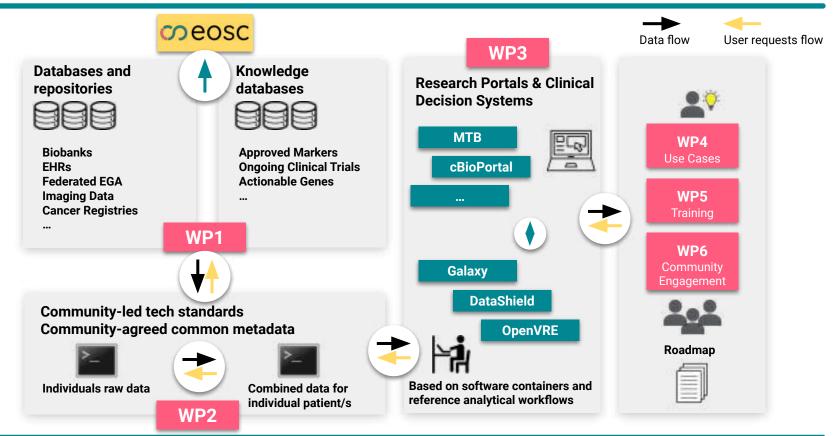
Software, Workflows and Portals for patient level clinical research

Clinical Decision Support Systems

#### **Technical overview**



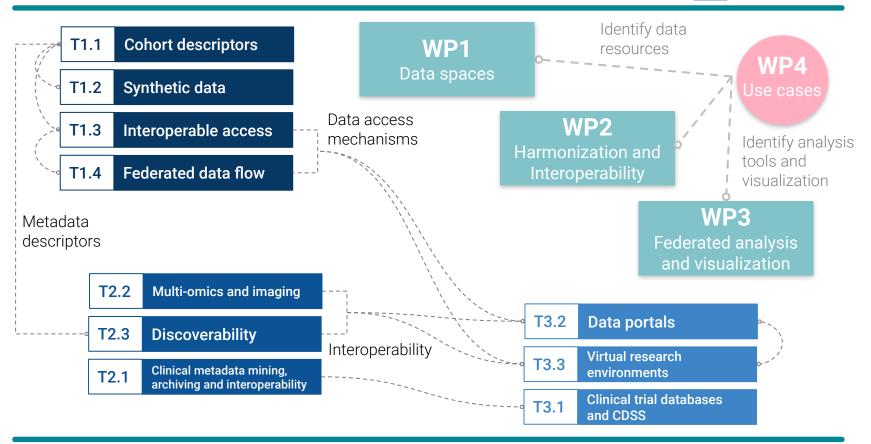




### **Technical WPs overview**







### **Use-cases overview**





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## **Kick-off meeting Outcomes: Squads**





**T4.1 (Lead: CNR IEOS)** Cancer risk identification and prevention by linking environmental data to cancer registry data

T4.2 (Lead: NKI) Data driven optimisation of cancer screening programs

Squad #1

**T4.3 (Lead: UP)** Data-driven treatment selection for localised tumours with multiple patient-derived data types

**T4.4 (Lead: NKI)** Data-driven treatment selection for localised tumour: improving the treatment of colorectal cancer by the inclusion of circulating DNA information

Squad #2

**T4.5 (Lead: VHIO)** Connecting omics data from multiple sources to a Clinical Decision Support System (CDSS) for precision treatment of metastatic CRC

Squad #3

**WP1**Data spaces

WP2
Harmonization and
Interoperability

WP3
Federated analysis and visualization

## Collaborations with other INFRAEOSC projects





- **BY-COVID** and **EOSC4Cancer** share the same conceptual architecture. Thus, lesson learnt in BY-COVID, e.g. on data access and mobilization, can be leveraged by EOSC4Cancer. Similarly, any technological development can be taken up, maintained and extended by EOSC4Cancer.
- EuroScienceGateway will leverage existing technologies (e.g. Galaxy, Pulsar, Dirac) and extend them to allow smart workflow execution scheduling around Europe. **EOSC4Cancer** represents the ideal scenario to tackle the challenges on analyzing sensitive data across different places.





## **EOSC Assoc: Technical and Engagement Challenges**



#### Top 3 technical challenges

- Accessibility of cancer-related datasets
- Harmonization and interoperability of cancer-data resources and analysis systems (FAIR principles)
- Integration of digital tools, data analytics, and Artificial Intelligence/ Machine learning tools in the cancer analysis portals and federated systems

#### Top 3 engagement challenges

- Align and engage with with large international and EU coalitions, e.g., ICGC-Argo, GA4GH, 1+MG/B1MG, UNCAN.eu, canSERV
- Contribute to EOSC services, the European Health Data Space (EHDS) and the Cancer Mission
- Learn from and create value for five use cases following the patient journey, laying the foundation for prospective studies

- Metadata and data quality
- Technical challenges on EOSC
- Infrastructures for quality research software

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# Thank you!

Contact: info@eosc4cancer.eu

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