THE CHAIMELEON PROJECT

ACCELERATING THE LAB TO MARKET TRANSITION OF AI TOOLS FOR CANCER MANAGEMENT

GA NO: 952172

Motivation (1)

- **Health imaging-based AI approaches** can become **useful clinical tools for improved cancer management**
    - E.g., in the areas of tumor characterization, prediction of tumor features, staging of tumor spread, stratification of patients, selection of most appropriate therapies, and estimation of clinical prognosis
- **Large quality-controlled datasets are needed** for the development to AI tools and bringing them to the market
- **Current challenges**:
    - **Limited quantity, quality, and representativeness** of the datasets hinder development of AI tools
    - **Lack of consistency** of medical image sources
    - **Ethics, integrity** and compliance with the **data protection** regulatory framework

Motivation (2)

- The CHAIMELEON project will address these challenges by
    - Developing an **open cloud-based tumor imaging data repository**
    - Providing **remote access** to the images and **processing pipelines for ingestion, curation, annotation, and harmonisation** of the data
    - Using the images in the repository to **train AI tools** aimed at assisting clinicians in cancer management
    - **Clinically validating the developed AI tools** via observational (non-interventional) studies

Objectives

- Provide **access to large databases in line with legal and ethical requirements**

- Establish an **EU-wide interoperable repository** with **quality-checked imaging data (about 40,000 cases)** as a **resource for developing and testing AI tools for cancer management**

- Set up a **distributed infrastructure** building on existing initiatives

- Explore disruptive **harmonisation** approaches and provide an online processing pipeline for images harmonisation

- Implement **online processing pipelines** enhancing the integrity and interpretability of AI solutions

- **Evaluate and validate** the repository internally and externally

- Perform **early clinical external validation of AI-based solutions**

- Ensure the **sustainability** of the repository beyond the project runtime and build a large and active userbase

Expected Impact

Improved management of the four most prevalent cancer types worldwide

Enabling experimentation and training of **AI-based solutions to improve diagnosis, treatment and follow-up**

Assistance to clinicians in daily decision making

Reducing the social and economic burden through precise and **personalised cancer management**

Contributing to the development of **technical, organisational and ethical standards for AI in health imaging**

Potential for expansion of repository to other types of cancer

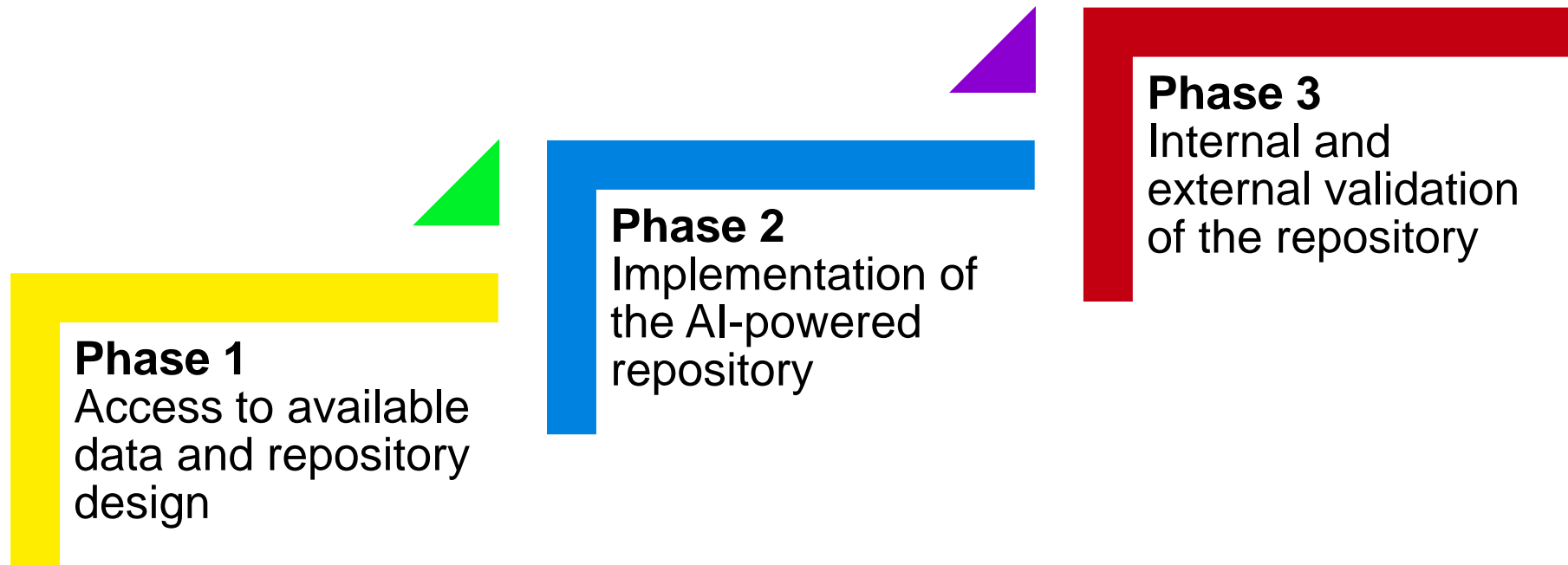**Increased trust in AI solutions** among users

Consortium
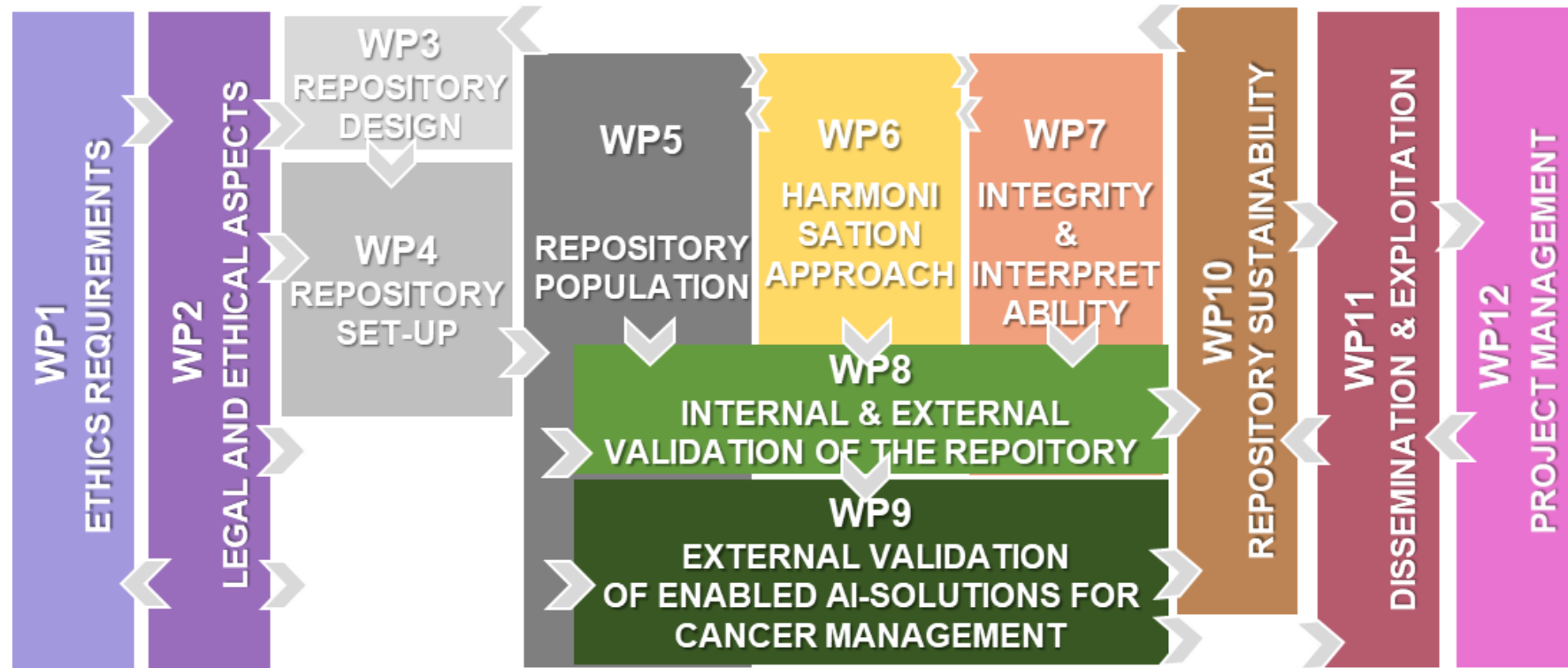
- 18 partners from 10 countries

Work Plan

Phase 1
Access to available data and repository design

Phase 2
Implementation of the AI-powered repository

Phase 3
Internal and external validation of the repository
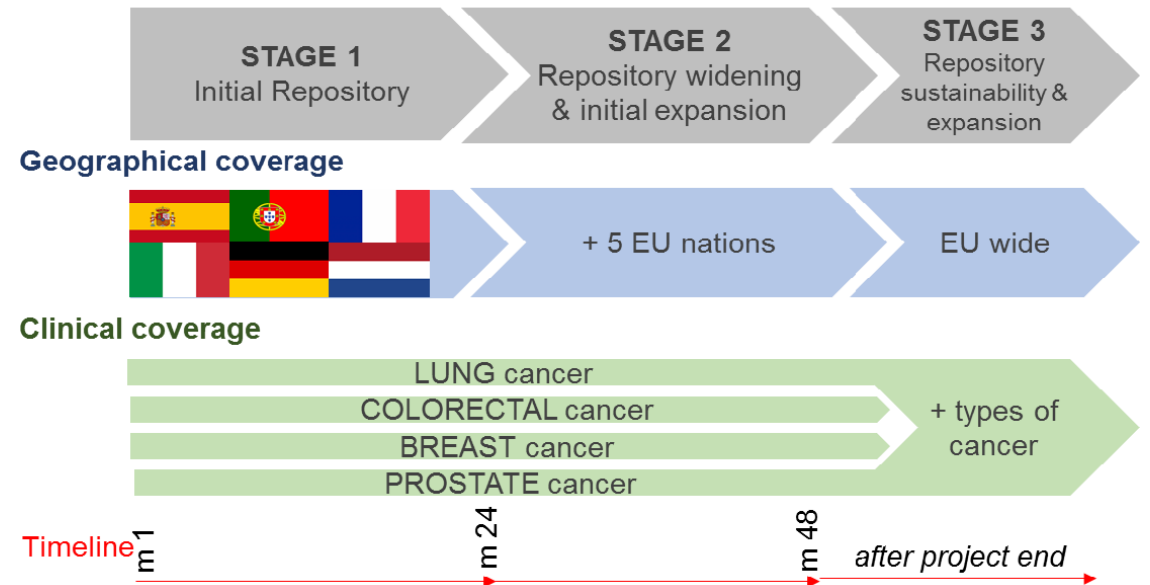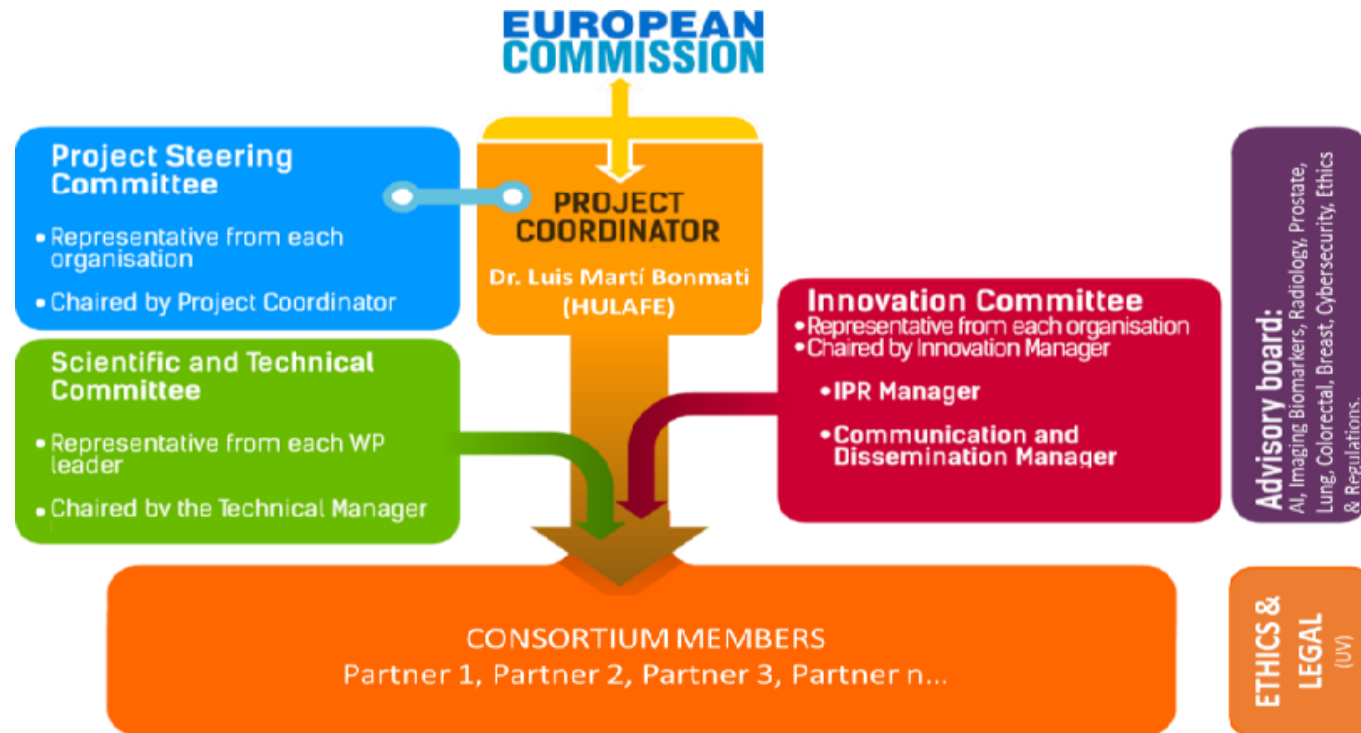
Work Packages

The CHAIMELEON Repository

- **Distributed infrastructure**, **interoperable** with existing repositories and biobanks

- **Imaging data in DICOM format** linked to the correspondent e-form (incl. data on patient profile, tumour, treatment and outcomes)

- **40,000 use cases** => approx. 20 million images

- **4 cancer types**: lung, breast, colorectal, and protstate

- **Secure**, **freely accessible** resource for AI experimentation in cancer management

CHAIMELEON Implementation Stages

| STAGE 1 Initial Repository | STAGE 2 Repository widening & initial expansion | STAGE 3 Repository sustainability & expansion |

Geographical coverage

| | + 5 EU nations | EU wide |

Clinical coverage

LUNG cancer
COLORECTAL cancer
BREAST cancer
PROSTATE cancer

+ types of cancer

Timeline m 1   m 24   m 48   *after project end*

Governance Structure

Key Facts

Name

Accelerating the lab to market transition of AI tools for cancer management

Acronym

CHAIMLEON

Runtime

September 1, 2020 - August 31, 2024

Project Coordinator

Prof. Luis Marti-Bonmati, HULAFE

Total funding

€ 8 784 038,75

FOR MORE INFORMATION VISIT

WWW.CHAIMELEON.EU