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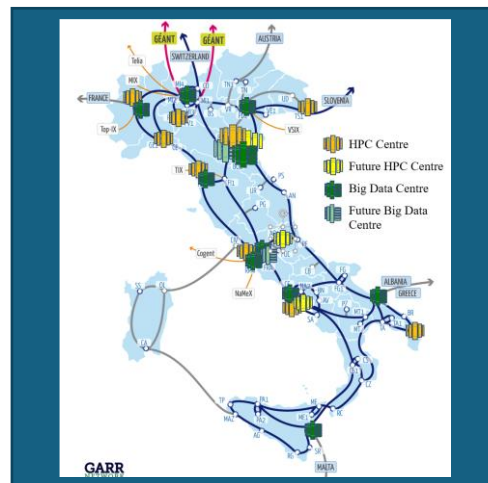
Project title National Centre for HPC, Big Data and Quantum Computing. Spoke 8: In Silico Medicine & Omics Data

Acronym ICSC

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Description

In the next few years, an unprecedented amount of omics data will be produced from both the scientific fields and the industrial economic system. These data are broad and quantitatively massive, including genomics, epigenomics, proteomics, metabolomics, lipidomics, metagenomics, transcriptomics and epitranscriptomics. Therefore, we will have to face the challenge of extracting value from this data explosion. In this context supercomputing, numerical simulation, Artificial Intelligence, high-performance data analytics and Big Data management will be essential and strategic for understanding and responding to grand societal challenges and in stimulating economic growth, allowing academia and industry to develop services and discoveries.

Aims

Against this scenario, we aim to provide a full proof-of-concept of data production, storage, integration and analysis, and to investigate drug-target interaction to improve diagnoses and therapies in different pathological conditions.

We plan to build a complete pipeline for integration and analysis of omics data through the development of tools and methods for integrative analysis of multi-omics data and the implementation of machine learning algorithms for efficient analysis of omics data.

Expected results

The main expected results are:

- building a world-class supercomputing cloud infrastructure for data storage, management and analysis;
- setting up centres of excellence with high level teams of experts to develop domain applications;
- setting up strong links between the scientific community and the industrial system;
- training young scientists as well as managers to become experts in these fields;
- implementation of organic and structural measures for innovation and for increasing the TRL.

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