

## Great achievements for the EU funded CHIC project

The novelty created by the large scale transatlantic CHIC project refers to a host of aspects of fundamental science, biomedical technology and future clinical medicine related to the quantitative understanding of cancer and the patient individualized treatment optimization of the disease.



CHIC project logo

## The Project

The EU funded CHIC (Computational Horizons in Cancer) project aimed at advancing ISM through the paradigm of ISO in the following aspects:

- **Fundamental (Basic) Science** (development of highly innovative clinically driven and oriented complex hypermodels and Oncosimulators by different modelling groups)
- **Information Technology** (semantic description of cancer models and hypermodels, development of a secure technological infrastructure and tools and services supporting the semi-automatic accessibility, execution and reusability of models as well as the building of hypermodels)
- **Clinical Medicine** (clinical drive and relevance of hypermodel building, clinical adaptation and partial clinical validation of hypermodels and Oncosimulators).

In the CHIC Consortium, 17 leading organizations from Europe and the USA share their expertise in clinical research and care, multiscale cancer modeling, multi-level data analysis, semantic interoperability and data protection. Highly innovative cancer hypermodels collaboratively developed by the consortium cancer modellers have provided, among other things, the framework and the testbed for the development of the CHIC technologies. The following four paradigmatic cancer types have been addressed:

- nephroblastoma,
- non small cell lung cancer,
- glioblastoma,
- prostate cancer.

Treatment with a variety of therapeutic modalities including chemotherapy, radiation therapy,

immunotherapy and hormone therapy has been considered and simulated.

## The project results

The actual components developed by CHIC include:

- a hypermodelling infrastructure consisting primarily of a hypermodelling editor,
- a clinical research application framework (CRAF),
- a hypermodelling execution environment, an infrastructure for semantic metadata management,
- a hypermodel repository, a hypermodel-driven clinical data repository,
- a distributed metadata repository and
- an *in silico* trial repository for the storage of executed simulation scenarios.

Multiscale models and data are semantically annotated using the developed ontological and annotating tools. An image processing and visualization toolkit, and cloud and virtualization services have also been developed. The CHIC tools, services, infrastructure and repositories can provide the community with a collaborative interface for exchanging knowledge and sharing work in an effective way. A number of developed features and tools enhance usability and accessibility.

An exemplary key novel characteristic of CHIC has been the large scale intercontinental cancer multimodeller hypermodelling strategy supported by cutting edge software engineering technologies. The latter enable the technologically facilitated semi-automatic creation of new patient-centred cancer hypermodels by reusing pre-existing simpler component models and combining them in several scientifically and clinically plausible ways. CHIC has exploited to the fullest the great potential of geographically distributed world leading research teams active in the fields of multiscale cancer modelling, biomedical informatics technologies and clinical medicine.

Read more about the CHIC project.

### Contact

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### Related topics

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