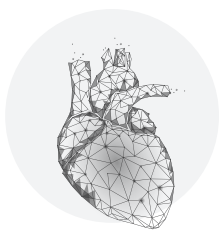
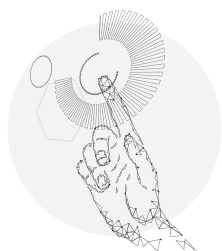


Sano is building Europe's foremost centre for the advancement of computational medicine, developing sophisticated engineering methods for the prevention, diagnosis and treatment of disease, to meet the overarching worldwide need for efficient, effective and radically streamlined healthcare.

The mission of Sano:



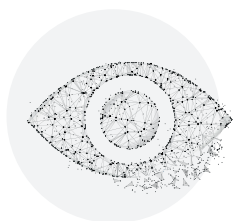
Development of new computational methods, algorithms, models and technologies for personalized medicine



Introducing new diagnostic and therapeutic solutions based on computerized simulations into clinical practice



Fostering creation and growth of enterprises which develop cutting-edge diagnostic and therapeutic technologies



Contributing to novel training and education curricula which meet the needs of modern personalised medicine

Our Centre is co-created with:



Sano

Centre for Computational Personalised Medicine
International Research Foundation

Nawojki 11
30-072 Kraków
Poland



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 857533 and is implemented as part of the International Research Agendas programme of the Foundation for Polish Science co-financed by the European Union under the European Regional Development Fund.



Centre for Computational Medicine

We create
computational
technologies for
optimised healthcare

Modelling and Simulation

...will expand research from the Virtual Physiological Human (VPH) initiative to lead pan-European developments in modelling and simulation. A rich assortment of complementary modelling approaches is already available, including 3D (e.g. Navier-Stokes solvers, Lattice Boltzmann approaches), 1D and 0D models of fluid mechanics for cardiovascular and respiratory applications, as well as Finite Element Analysis, Growth and Remodelling frameworks, and Agent-Based Models of structural mechanics for cardiovascular, musculoskeletal and oncological applications.

High Performance Computing

...will address fundamental computer science challenges related to **Modelling and Simulation** and **In Silico Techniques**. The computational and data processing needs of the Centre will require pushing the boundaries of current state-of-the-art HPC and cloud infrastructures. This includes research to align the capabilities of modern computing environments with the computational needs of tools, workflows and institutional systems to deliver patient-specific in silico care on clinically-viable timescales.

Data Science

...will address challenges associated with processing healthcare data, including medical images. Applying tools developed by the Centre both for entire populations and for dense data sources describing individual patients will require further advancement of the state of the art in Big Data processing and close integration with research in **Healthcare Informatics**.

In Silico Techniques

...will develop the methodology to extend in silico techniques to various aspects of healthcare. Sano will integrate individual in silico patient stratification and treatment planning across many clinical domains, allowing the influence of multi-morbidity to be assessed within the in silico treatment pathway. Our ambition is also to advance the emerging area of in silico clinical trials, by applying modelling and simulation to evaluation of devices, drugs and interventions over enormous trial populations, with HPC infrastructures being leveraged to bring down the required time and cost.

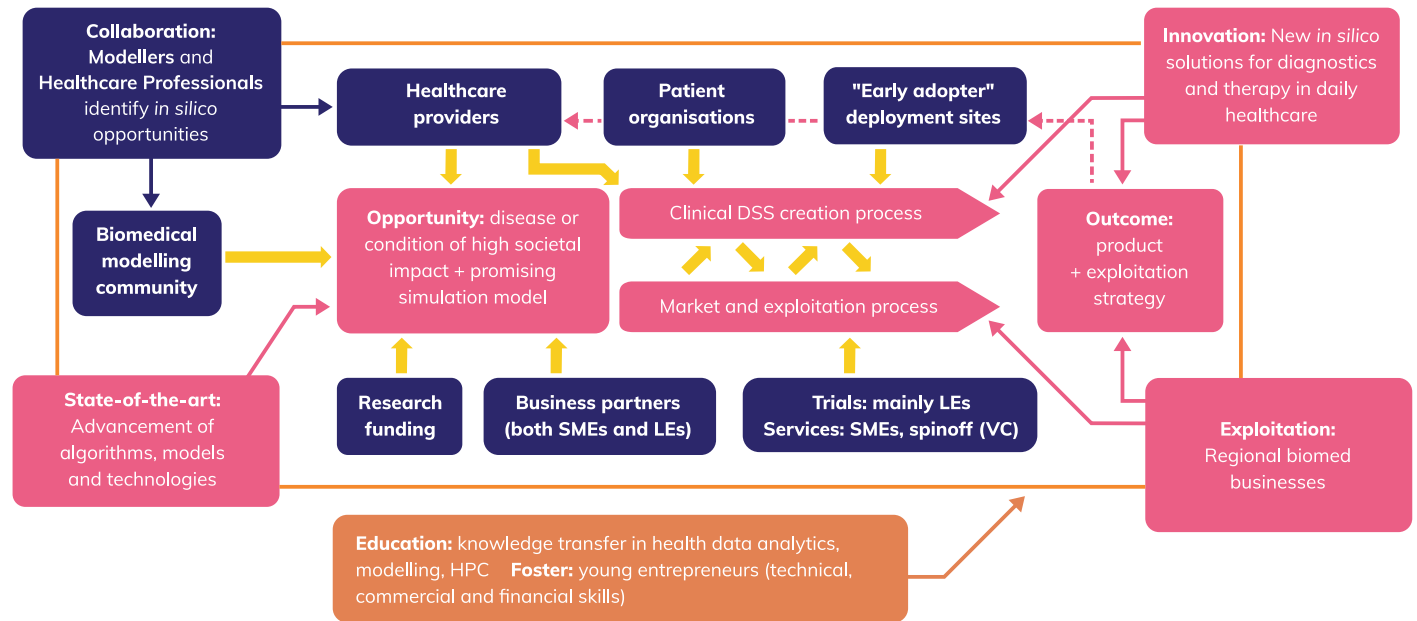
Healthcare Informatics

...will address challenges associated with integration of next-generation scientific tools, especially computerized decision support systems, with healthcare control systems. The required techniques include theoretical and practical integration methodologies to benefit from systems in widespread clinical use (PACS, Clinical Management Systems, etc.), as well as improving existing procedures to maximise the availability of anonymous data while maintaining its integrity.

Algorithmic Decision Science

...will integrate the five preceding areas into Decision Science: a novel international academic discipline. By introducing a formalised, rigorous structure for the development of fine-grained, evidence-based rules, operating on up-to-date and thoroughly validated input data, it will supplant expert systems as the basis for machine-enhanced decision support.

Value Chain



Expected Impacts of Computational Medicine

