ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

SYSTEMS AND PERSONALISED MEDICINE

Moving towards the effective integration of personalised medicine approaches into healthcare services and systems to the benefit of patients and citizens.

Taking into account specific risk factors, genetic phenotype, pharmacokinetic characteristics, and other specific features unique to each patient, personalized medicine approaches are studied at the University of Bologna. They are mostly based on **systems biology research and on the rapid development of omics and high-throughput technologies**, at the edge between bed and bench side. Major clinical areas of relevance are chronic diseases such as hypertension, age-related comorbidities and neurological disorders.

Furthermore, advanced skills in complex networks, deterministic and stochastic modelling of physiological systems with multiscale approaches, advanced data-driven techniques based on machine and statistical learning methods are strongly present in several research groups across the University.

Other points of excellence are the **big data analytics methods**, including the integration of heterogeneous data sources leveraging on the computing resources and cloud environment owned by the University. This has led to improve and evaluate **preventive strategies** and to identify the personalised and precision medicine, with particular relevance for **early diagnosis** and to predict clinical outcomes like falls, frailty, depression, and functional decline in older people.

HIGHLIGHTS

Ageing and systems medicine: the University of Bologna has a long-lasting experience on applying a systems medicine approach to age-related diseases and other issues, and this is reflected in a number of EU funded projects, e.g. H2020 **PROPAG-AGING**, **ESCAPE**, **QSPainRelief**.

Personalised medicine in haematology and oncology: the University of Bologna is involved in several projects related to data analytics and big biomedical data integration for personalised medicine in the haematology and oncology areas, e.g. IMI-2 **HARMONY** and **HARMONY PLUS**, H2020 **GenoMed4All**, and **PRIMAGE**.