

Call Assegni di ricerca 2021 FSC 2014-2020 della Regione Toscana, project “*Nanobiosensors in precision medicine*”, acronym NanoPM

Description of the project

This research project involves collaboration between two organizations with complementary skills in order to contribute to two of the crucial junctions for the transition from "evidence based medicine" to "precision medicine", with particular attention to diagnostics. Essential elements of this transition are the replacement of standardized therapeutic protocols with personalized treatments, and a definition of these treatments based on the molecular characteristics of both the pathology and the patient. The proponents identify as essential elements of this new medicine (i) omics and advanced-imaging technologies that allow the profiling of pathology and patient, and (ii) ultra-sensitive detection of the molecular signals characteristic of the various pathologies. By combining the expertise on nanotechnology, bioinformatics and data science of the Science Class of the Scuola Normale Superiore, and those on omics sciences, advanced imaging and bioinformatics of the Fondazione Pisana per la Scienza ONLUS, in this project a central element of the transition to "precision medicine" is addressed: make the analysis of the large masses of data produced by the molecular profiling processes of patients and pathologies accessible through the development of advanced visualization systems that allow the use of this data by medical personnel without of specialization in bioinformatics.

More in detail, the following research activities will be carried out in the project: integration of data obtained with various omics technologies; development of a system to analyze and correlate data from molecular analysis using a protocol based on a graphical interface. Molecular information derived from omics analysis will be correlated with that derived from advanced microscopy techniques.