



An integrated POC solution for diagnosis and therapy monitoring of Heart Failure patients

- KardiaTool is a project funded by the European Commission within the Horizon 2020 Research and Innovation program with € 4.9 M for the next 3.5 years.
- The results of KardiaTool will allow a quick, easy and efficient diagnosis at the point-of-care, and a personalized and improved therapy monitoring and health care for patients suffering from heart failure.
- Fourteen partners from ten different countries, including universities, research centers and enterprises, participate in the project, providing the necessary experience to ensure the success of the project in all its stages of development.

February 16, 2018.

The need

More than 26 million patients worldwide suffer from heart failure every year, according to the European Heart Failure Association. A disorder often associated with a bad diagnosis, with the consequent increase in mortality and morbidity, and frequent re-hospitalizations, which are a great problem for patients and their families, as well as a great economic burden for the healthcare system.

In fact, in Europe, costs related to heart failure account for approximately 2 % of the total healthcare expenses, and are usually associated with the patient's hospitalization. With an average patient hospitalization time of 11 days, the heart failure hospitalization cost is estimated approximately in € 23,000 per patient in the age group of 18-64 years old.

As life expectancy increases worldwide, we are facing new challenges of improving quality of life and healthcare at affordable costs, both for patients, and for the system in general. In the case of heart failure, the diagnosis is complicated, there is a wide spectrum of potential clinical manifestations of the disease and signs symptoms are often non-specific .

Aim

KardiaTool's challenge is to achieve a fast, easy and reliable diagnosis of the disease, in order to ensure a subsequent personalized therapy for each patient.

KardiaTool will develop a personalized MNBS platform and bring a new laboratory proven concept from the laboratory to clinic, addressing priority needs in healthcare diagnosis and therapy monitoring, an approach that is expected to considerably improve the healthcare delivery at the POC and quality of life of patients and reduce the healthcare costs.

The KardiaTool diagnostic and therapy control platform will provide health professionals with accurate results at the point of care, and in short time. In this way, patients can be quickly and easily diagnosed and treated accordingly.

The KardiaTool platform will include a portable device, KardiaPOC (point of care), to detect, in a fast and precise way, the biomarkers of heart failure. It will be coupled to the KardiaLOC device, a disposable and low cost laboratory-on-a-chip, which will integrate all types of sensors, actuators, microelectromechanical systems, microelectronics, biochemicals, microfluidic system, and functionalized magnetic nanoparticles in a single space, to detect the biomarkers from saliva samples.

In addition, the platform will also include KardiaSoft, a decision support software based on predictive modeling techniques which will analyze the data measured by the KardiaPOC and other patient's data, directly added by the healthcare professionals, to deliver information on the diagnosis and the therapy monitoring.

KardiaTool, a 3.5-year project financed by the European Commission, includes the participation of fourteen partners from ten different countries: nine European countries and the United States. The team is formed by five universities, five research centers, two small and medium-sized enterprises (SMEs), and two industrial partners. The members of the consortium of the KardiaTool project are:

- École Normale Supérieure de Lyon (ENS) - France
- University of Pisa (UNIFI) - Italy
- University of Ioannina (UIO) - Greece
- University of Surrey - UK
- University College Dublin - Ireland
- Foundation for Research and Technology Hellas (FORTH) - Greece
- CNM-IMB and ICMAB from the Spanish Research Council (CSIC) - Spain
- Consiglio Nazionale delle Ricerche (CNR) - Italy
- Fraunhofer Institute for Integrated Circuits IIS - Germany
- Micronit Microtechnologies B.V. - Netherlands
- BioTray - France
- Imec - Belgium
- ValoTec – France
- EnaChip Inc. - USA

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