

## **Portable diagnostics for liquid biopsy application**

Liquid biopsy represents a revolutionary opportunity for rapid follow-up and personalized therapies in cancer patients, but current diagnostic tests for the liquid biopsy remain cumbersome, laboratory-bound, expensive and multi-step processes that typically require hours or days to return an answer to the physician's hands. It is the case of the latest advance in clinical oncology, represented by the droplet digital PCR (ddPCR) and beads amplification magnetics-PCR (BEAMing-PCR) technologies: although acquired resistance and tumor heterogeneity can be detected, they require trained personnel and specialized laboratories. In order to ensure rapid appropriate care for patients, simple, rapid, inexpensive, tools for the quantitative detection of specific tumor markers are still urgently needed. The project is aimed to design, characterize and develop portable devices for the de-centralized monitoring of cancer biomarkers correlated to cancer, in particular triple negative breast cancer, towards a liquid biopsy in chip. Taking inspiration from the glucose strip for diabetes, the goal is to provide cancer patients a toolkit for making cancer care more effective. The proposed project could significantly impact the safety and efficacy of therapies and medical procedures providing in turn many scientific, technological and socio-economic benefits, also generating a tremendous impact on low/middle income countries, that are characterized by scarcity of specialists and financial restrictions.

The described project is part of the following MFAG project funded by AIRC (2023-2027)

“MFAG, Rif. 27586 - MicroRNA signature detection in triple negative breast cancer: towards liquid biopsy on chip (miRNACHIP) Budget 480.120,38 euro