SIGNATURE PREDICTOR OF RESPONSE TO LIQUID BIOPSY BASED TO IMMUNOTHERAPY IN LUNG CANCER – OCTOPUS

PROTECTION

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BACKGROUND

Lung cancer is the most commonly diagnosed tumor and the leading cause of cancer-related mortality worldwide (with a 5-year survival rate in Spain of less than 11%). Most patients are diagnosed at advanced stages, where surgery is not feasible and therapeutic decision-making must be rapid and precise. Tumor heterogeneity and the biological complexity of this disease make it difficult to select the most appropriate treatment for each patient.

Immunotherapy based on immune checkpoint inhibitors (ICIs) has marked a milestone in cancer treatment. However, only between 20% and 40% of patients respond favorably, while others experience toxicities and delays in receiving effective therapies. Currently, there are no standardized and effective biomarkers to predict which patients will benefit from immunotherapy. Treatment selection relies on solid biopsies, which are invasive, provide a limited view of the tumor, do not reflect its heterogeneity, and do not allow for dynamic monitoring. These procedures require specialized technical resources that are not always feasible in daily clinical practice. Current alternatives, such as PD1-PDL1 staining or calculation of tumor mutational burden (TMB) based on whole exome sequencing (WES), present issues of representativeness, technical complexity, and limited clinical applicability.

Liquid biopsy, which enables the analysis of circulating tumor material from a simple blood sample, is emerging as a **promising alternative** for comprehensive, real-time, and non-invasive tumor characterization.

This technique allows for the detection and monitoring of **predictive biomarkers**, such as genetic mutations and circulating tumor DNA, throughout the course of treatment. However, predictive tools based on liquid biopsy are still scarce and poorly standardized in clinical practice. The main challenge for researchers in this field is to develop reliable and easily implementable predictive biomarkers that enable the precise selection of patients who will benefit most from immunotherapy.

ACHIEVEMENTS AND RESULTS

A **predictive genetic signature** is presented, consisting of a **set of novel genetic biomarkers** detected in circulating tumor DNA from a blood sample (liquid biopsy), capable of predicting the response to immunotherapy in patients with advanced lung cancer. This technology has demonstrated its usefulness in stratifying patients and facilitating personalized treatment selection, overcoming the limitations of solid biopsies, improving the accuracy of clinical decision-making, and avoiding unnecessary toxicities and costs.

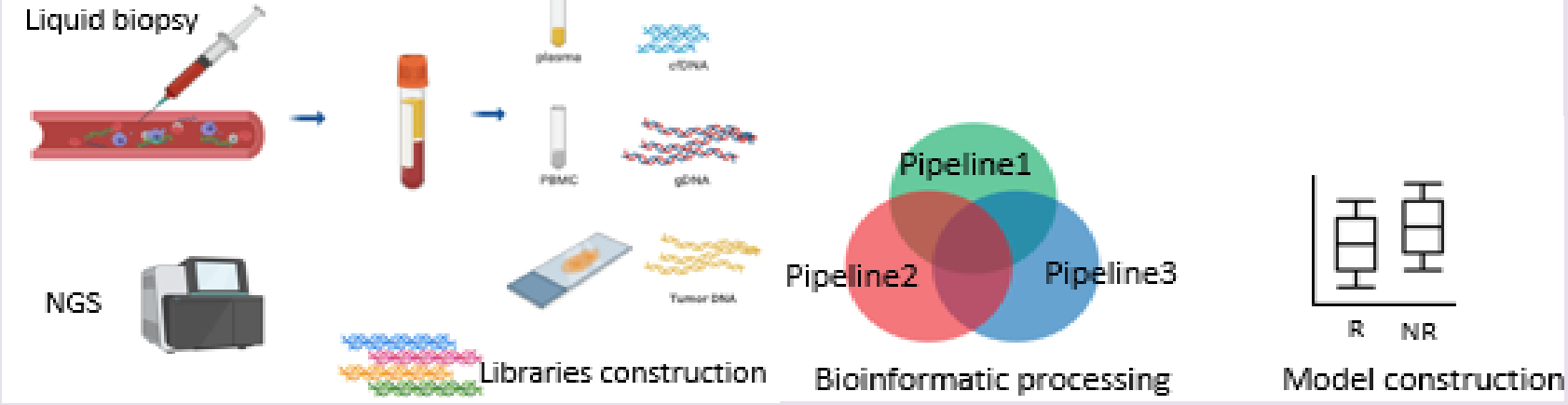
PURPOSES AND ADVANTAGES

The **main advantages** of this technology are:

- A non-invasive method that can be easily integrated into routine clinical practice, based on accessible technologies such as quantitative PCR.
- Ability to capture tumor heterogeneity and perform dynamic patient monitoring.
- Real and potentially scalable applicability to other tumor types
- Reduction of costs and time compared to conventional techniques, enabling more efficient and equitable precision medicine.

COLLABORATION OFFER

This offer can be formalized as a "Partnership Agreement" to co-develop this technology or as a "License Agreement" for the direct use of the proposed technology. If you are interested in this offer or need more information, please contact us.



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