Lipidomics approach to identify biomarkers in breast cancer tissue from patients: development of liquid biopsy

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Introduction.

Lipids play a crucial role in human metabolism, and lipidomics is a valuable tool for understanding and identifying these metabolic alterations. Breast cancer is one of the most prevalent diseases affecting women. In this context, lipidomic analysis of breast cancer tissue from patients has the potential to identify biomarkers associated with tumor development. In this regard, a standardization approach for the lipidomic method was developed, seeking for a liquid biopsy of tumoral tissue.

Objectives.

The study sought to identify and quantify potential lipid biomarkers within tissue samples from breast cancer patients, encompassing various classifications of the disease.

Material and Methods.

Tissue samples were subjected to analysis via liquid chromatography-tandem mass spectrometry (LC-MS/MS), enabling differentiation among them. Statistical analyses were integrated into the data collection process.

Results and Discussion.

The validation method results showed a potential approach to describe lipidomics in biological samples, considering that the majority of tests had a coefficient of variation below the limit allowed by regulatory agencies such as the FDA and ANVISA. The tumor tissue analysis demonstrated unique and diverse biomarkers related to subtype.

Conclusions.

This study concludes that the standardized analytical method exhibits reliability and robustness, positioning it as a viable approach for extracting potential lipid biomarkers in breast cancer patient samples. The method's accuracy and validity underscore its utility in advancing our understanding of breast cancer pathology and facilitating more effective diagnostic and therapeutic strategies.

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