

# Clinical utility of liquid biopsy in breast cancer: A systematic review

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## Abstract

Advancements in genetic sequencing techniques along with the identification of specific mutations and structural changes in multiple cancer genes, make it possible to identify circulating tumor cells and cell free nucleic acids as blood-based biomarkers, serving as a liquid biopsy (LB) with great utility for the diagnosis, treatment and follow-up of patients with neoplasms. This systematic review focuses on the clinical utility of LB in patients with breast cancer (BC). Articles published between 1990 and 2021 were included. Databases searched: Trip Database, WoS, EMBASE, PubMed, SCOPUS, and Clinical Keys. Variables studied: Publication year, country, number of cases, primary study design, LB detection methods, genes found, overall survival, disease-free survival, stage, response to treatment, clinical utility, BC molecular type, systemic treatment and methodological quality of primary studies. Of 2619 articles, 74 were retained representing 12 658 patients, mainly cohort studies (66.2%), the majority were from China (15%) and Japan (12.2%). All primary studies described clinical stage and type of systemic treatment used. Most used biomarker detection method: DNA (52.7%) and type of analysis: quantification of total cfDNA (35.1%). PIK3CA mutation was most frequent (62.9%). Evidence suggests clinically useful applications of BC. Though heterogeneous, publications suggest that LB will constitute part of the standard diagnostic-therapeutic process of BC.

**Keywords:** biomarkers; breast cancer; cell free circulating DNA; circulating tumor cells; liquid biopsy.