

Liquid biopsy: From discovery to clinical implementation

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Liquid Biopsy has been defined as the analysis of tumor cells or products released from primary or metastatic tumor tissues into the blood or other body fluids. Over the past ten years, CTCs, ctDNA and extracellular vesicles have received enormous attention as new biomarkers and subject of translational research. In particular, CTC research has opened new avenues for a better understanding of tumor biology in cancer patients, including intra-patient heterogeneity and evolution towards resistance to therapy. Although both biomarkers are already used in numerous clinical trials, their clinical utility is still under investigation with first promising results. Clinical applications include early cancer detection, improved cancer staging, early detection of relapse, real-time monitoring of therapeutic efficacy and detection of therapeutic targets and resistance mechanisms. In particular, interventional clinical studies are required to demonstrate clinical utility of liquid biopsy as an important prerequisite for the introduction of this new diagnostic approach into clinical practice. Moreover, assay harmonization and standardization as conducted by international consortia like the European Liquid Biopsy Society (ELBS; www.elbs.eu) is essential. Here, I will discuss a conceptual framework of CTC and ctDNA assays and point out current challenges of CTC and ctDNA research, which might structure this dynamic field of translational cancer research.

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