

Liquid Biopsy: From Discovery to Clinical Application [†]

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Abstract: Over the past 10 years, circulating tumor cells (CTCs) and circulating tumor DNA (ctDNA) have received enormous attention as new biomarkers and subjects of translational research. Although both biomarkers are already used in numerous clinical trials, their clinical utility is still under investigation with promising first 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. Here, we propose a conceptual framework of CTC and ctDNA assays and point out current challenges of CTCs and ctDNA research, which might structure this dynamic field of translational cancer research. The analysis of blood for CTCs or cell-free nucleic acids, called “liquid biopsy” has opened new avenues for cancer diagnostics, including early detection of tumors, improved risk assessment, and staging, as well as early detection of relapse and monitoring of tumor evolution in the context of cancer therapies.

Keywords: circulating tumor cells; liquid biopsy; cancer; biomarker; precision medicine.

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Conflicts of Interest

C.A-P. has received honoraria from Menarini and patent applications related to CTC technologies.