

# Liquid biopsy: from discovery to clinical implementation



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### **Abstract**

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 and ctDNA 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](http://www.elbs.eu)) is essential. Here, I will discuss the potential and current challenges of liquid biopsy research for understanding human cancer biology and the implementation of this new diagnostic approach into clinical studies with emphasis on solid tumors and immunotherapies.

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### **Biography**

Prof. Klaus Pantel is the founding Director of the Institute of Tumor Biology (est. 2002) at the University Medical Center Hamburg-Eppendorf, Germany. Prof. Pantel graduated from the University of Cologne in 1986 and completed his dissertation in 1987 in the field of mathematical models of hematopoiesis. After his postdoctoral training in the USA at Wayne State University, Detroit, where he conducted research on hematopoietic stem cell regulation, he spent 10 years at the Institute of Immunology at the University of Munich. Prof. Pantel's pioneering work in the fields of micrometastasis (h-factor: 145) has been recognized by the AACR Outstanding Investigator Award 2010, the German Cancer Award 2010, and 4 ERC Grants. He is the Founder and current President of the European Liquid Biopsy Society ([www.elbs.eu](http://www.elbs.eu)) and the Scientific Coordinator/Lead-PI of the EU consortia PANCAID (<https://pancaid-project.eu/>) and GUIDE-MRD (<https://www.guidemrd-horizon.eu/>).