Liquid biopsy

- Direct SERS profiling of small extracellular vesicles in cerebrospinal fluid for pediatric medulloblastoma detection and treatment monitoring
- Liquid biopsy in early detection and monitoring of CNS metastases
- Liquid biopsy for the detection of H3K27m in patients with brainstem tumors
- Fostering the implementation of liquid biopsy in clinical practice: meeting report 2024 of the European Liquid Biopsy Society (ELBS)
- Carotid Plaque-Derived Small Extracellular Vesicles Mediate Atherosclerosis and Correlate With Plaque Vulnerability
- Single Extracellular Vesicle Profiling to Define Brain Specific Traumatic Brain Injury Induced Neuro-Inflammation
- Comparative Brain and Serum Exosome Expression of Biomarkers in an Experimental Model of Alzheimer-Type Neurodegeneration: Potential Relevance to Liquid Biopsy Diagnostics
- Raman liquid biopsy: a new approach to the multiple sclerosis diagnostics

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A liquid biopsy is a non-invasive medical test that analyzes biological fluids, typically blood, but sometimes other bodily fluids like urine or cerebrospinal fluid, to obtain information about a person's health or detect specific medical conditions. Unlike traditional biopsies, which involve the removal of tissue samples through invasive procedures, liquid biopsies rely on the analysis of various components found in bodily fluids. Liquid biopsies are increasingly being used in oncology and other medical fields for early cancer detection, monitoring treatment responses, and assessing genetic mutations. Here are key aspects of liquid biopsies:

Cancer Detection and Monitoring: Liquid biopsies are commonly used in oncology to detect cancer or monitor cancer progression. They can identify circulating tumor cells (CTCs), cell-free DNA (cfDNA), or other biomarkers associated with cancer. This allows for early cancer detection, monitoring treatment effectiveness, and tracking cancer's genetic changes over time.

Types of Liquid Biopsies:

Circulating Tumor Cells (CTCs): CTCs are cancer cells that have detached from the primary tumor and entered the bloodstream. Detecting and analyzing CTCs can provide valuable information about cancer metastasis and its potential spread. Cell-Free DNA (cfDNA): cfDNA consists of small fragments of DNA that are released into the bloodstream by dying cells, including tumor cells. Analyzing cfDNA can reveal genetic mutations, such as those driving cancer growth. Extracellular Vesicles (EVs): EVs, including exosomes, are tiny membrane-bound vesicles released by cells. They can contain genetic material and proteins that may be indicative of disease. MicroRNA: MicroRNAs are small RNA molecules involved in gene regulation. Abnormal levels of specific microRNAs can be associated with various diseases, including cancer. Proteins: Liquid biopsies can also analyze specific proteins or biomarkers in the bloodstream to detect or monitor diseases. Applications Beyond Cancer: Liquid biopsies are not limited to cancer diagnosis and monitoring. They can be used in other medical fields, such as prenatal testing to detect genetic abnormalities in fetal DNA in maternal blood, monitoring organ transplant rejection, and assessing infectious diseases.

Advantages: Liquid biopsies offer several advantages over traditional tissue biopsies:

Non-invasive: They do not require surgical procedures or tissue removal. Accessibility: Blood samples

are relatively easy to obtain. Dynamic Monitoring: Liquid biopsies can be used to monitor disease progression and treatment responses over time. Potential for Early Detection: Liquid biopsies may detect diseases at earlier stages when treatment options are more effective. Limitations: Liquid biopsies are not suitable for all types of diseases, and their sensitivity and specificity can vary depending on the condition being tested. Additionally, their use may be limited by factors such as the presence of small tumor sizes or low levels of disease-specific markers.

Research and Clinical Use: Liquid biopsies are an active area of research, and their clinical use is expanding. They are increasingly integrated into cancer care and are being explored for their potential in other medical fields.

Liquid biopsies hold great promise in improving the early detection and management of various diseases, particularly cancer while minimizing the invasiveness and discomfort associated with traditional biopsy procedures. However, their clinical utility and accuracy continue to evolve as technology and research advance in this field.

Indications

Liquid Biopsy for cancer diagnosis

Liquid Biopsy for cancer diagnosis