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Liquid biopsy: creating opportunities in brain space

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Abstract

In recent years, liquid biopsy has emerged as an alternative method to diagnose and monitor tumors. Compared to classical tissue biopsy procedures, liquid biopsy facilitates the repetitive collection of diverse cellular and acellular analytes from various biofluids in a non/minimally invasive manner. This strategy is of greater significance for high-grade brain malignancies such as glioblastoma as the quantity and accessibility of tumors are limited, and there are collateral risks of compromised life quality coupled with surgical interventions. Currently, blood and cerebrospinal fluid (CSF) are the most common biofluids used to collect circulating cells and biomolecules of tumor origin. These liquid biopsy analytes have created opportunities for real-time investigations of distinct genetic, epigenetic, transcriptomics, proteomics, and metabolomics alterations associated with brain tumors. This review describes different classes of liquid biopsy applications, challenges, recent technological advances, and clinical trials in the brain have also been provided.

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