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## Recent Developments in Blood Biomarkers in Neurooncology

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## Abstract

**Purpose of review:** Given the invasive and high-risk nature of brain surgery, the need for noninvasive biomarkers obtained from the peripheral blood is greatest in tumors of the central nervous system (CNS). In this comprehensive review, we highlight recent advances in blood biomarker development for adult and pediatric brain tumors.

**Recent findings:** We summarize recent blood biomarker development for CNS tumors across multiple key analytes, including peripheral blood mononuclear cells, cell-free DNA, cell-free RNA, proteomics, circulating tumor cells, and tumor-educated platelets. We also discuss methods for enhancing blood biomarker detection through transient opening of the blood-brain barrier. Although blood-based biomarkers are not yet used in routine neuro-oncology practice, this field is advancing rapidly and holds great promise for improved and non-invasive management of patients with brain tumors. Prospective and adequately powered studies are needed to confirm the clinical utility of any blood biomarker prior to widespread clinical implementation.

Keywords: Biomarkers; Blood; Glioma; Liquid Biopsy; Neuro-Oncology; cfDNA.

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