

Review Crit Rev Oncol Hematol. 2024 Sep 7:104504. doi: 10.1016/j.critrevonc.2024.104504.

Online ahead of print.

# The Potential of Circulating Cell-Free RNA in CNS Tumor Diagnosis and Monitoring: A Liquid Biopsy Approach

Carlos Pilotto Heming <sup>1</sup>, Veronica Aran <sup>2</sup>

Affiliations

PMID: 39251048 DOI: [10.1016/j.critrevonc.2024.104504](https://doi.org/10.1016/j.critrevonc.2024.104504)

## Abstract

Early detection of malignancies, through regular cancer screening, has already proven to have potential to increase survival rates. Yet current screening methods rely on invasive, expensive tissue sampling that has hampered widespread use. Liquid biopsy is noninvasive and represents a potential approach to precision oncology, based on molecular profiling of body fluids. Among these, circulating cell-free RNA (cfRNA) has gained attention due to its diverse composition and potential as a sensitive biomarker. This review provides an overview of the processes of cfRNA delivery into the bloodstream and the role of cfRNA detection in the diagnosis of central nervous system (CNS) tumors. Different types of cfRNAs such as microRNAs (miRNAs), long noncoding RNAs (lncRNAs) and circular RNAs (circRNAs) have been recognized as potential biomarkers in CNS tumors. These molecules exhibit differential expression patterns in the plasma, cerebrospinal fluid (CSF) and urine of patients with CNS tumors, providing information for diagnosing the disease, predicting outcomes, and assessing treatment effectiveness. Few clinical trials are currently exploring the use of liquid biopsy for detecting and monitoring CNS tumors. Despite obstacles like sample standardization and data analysis, cfRNA shows promise as a tool in the diagnosis and management of CNS tumors, offering opportunities for early detection, personalized therapy, and improved patient outcomes.

**Keywords:** Liquid biopsy; brain tumor; cancer biomarkers; cell-free RNA; central nervous system.

Copyright © 2024 Elsevier B.V. All rights reserved.

[PubMed Disclaimer](#)