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The Power of Liquid Biopsy in Colorectal Cancer Prognosis and Therapy Modulation †

Bianca Galateanu [1,*], Octav Ginghina [2,3], Marius Zamfir [2], Mara Mardare [2], Irina Bondoc [2], Andrada Spanu [2], Marieta Costache [1], Ariana Hudita [1]

[1] Department of Biochemistry and Molecular Biology, University of Bucharest, Bucharest, Romania
[2] "Sf. Ioan" Clinical Emergency Hospital, Bucharest, Romania
[3] "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania
* Correspondence: bianca.galateanu@bio.unibuc.ro;
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Abstract: Cancer management has tremendously evolved in the last decade in terms of diagnostic tools, surgical procedures, and the availability of new therapy. Regarding diagnostic, the histopathologic exam remains a reference analysis, but immunohistochemical investigations for tumor-specific markers expression and molecular biology assays lightness valuable insights for a personalized approach and patients' stratification. Colorectal tumors heterogeneity and their high susceptibility to gaining mutations associated with drug resistance make initial genomic profiling of the resected tissue just a starting point for therapy election. In this view, liquid biopsy has been proposed as a new and promising tool for real-time monitoring of the disease evolution, offering valuable output information for prognosis and therapy modulation. This non-invasive test, consisting of the harvest of a sample of peripheral blood, could be performed at any time in the patient's evolution and could provide a worthy decision-making solution, especially when surgery is not available. Liquid biopsy serves as a valuable tool in cancer management either by analyzing circulating tumor cells (CTCs), circulating tumor DNA (ctDNA), or circulating exosomes depleted from tumor cells. CTCs are tumor cells shed daily from growing tumors and enter the systemic circulation, responsible for distant metastasis. Despite their unique ability to trick the immune system by "hiding" through the epithelial to mesenchymal transition, these cells can be detected, counted, and further analyzed. More, the ctDNA, which is a fraction of the cell-free DNA, can be analyzed by various powerful molecular biology assays such as next-generation sequencing (NGS) to unreveal the molecular landscape of the patient's tumor at the specific moment of the analysis. Despite the major progress made in the last few years, there is still a need for optimization of protocols and validation of assays when comparing tissue-related results with liquid biopsy.

Keywords: liquid biopsy; colorectal cancer; CTCs; ctDNA; exosomes;

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Conflicts of Interest

The authors declare no conflict of interest.