NOVEL LABORATORY BIOMARKERS IN COLORECTAL CANCER MANAGEMENT

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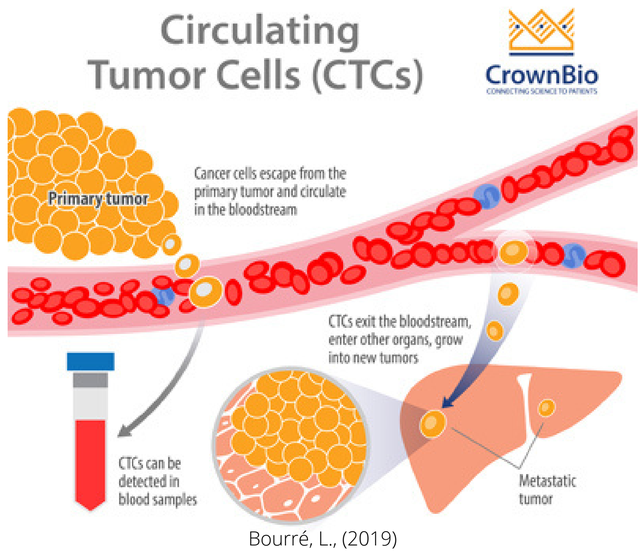
INTRODUCTION

Approximately one million patients worldwide are being diagnosed with colorectal cancer (CRC) each year and about 500.000 death cases due to the disease. Several laboratory markers have been traditionally used to detect CRC but none of them has demonstrated efficient sensitivity and specificity; therefore new markers are being investigated for clinical use in detection and monitoring of the disease, prognosis of therapeutic effectiveness and prediction of treatment toxicity.

Novel biomarkers in CRC management	Traditional biomarkers in CRC management
HGFs	CEA
IGFBP-2	CA 19-9
TNF-α	TAG-72
IL-6	CRP
ADH	
CTCs	
miRNA and lncRNA	



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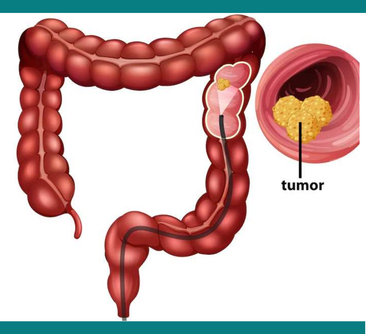
NOVEL BIOMARKERS IN CRC MANAGEMENT



CSFs — Higher concentrations of M-CSF have been reported in patients with lymph node or distant metastases; they can be used as potential biomarkers for diagnosis and prognosis of CRC

IGFBP-2 — Due to its insufficient specificity and sensitivity, it can not be used alone for early detection of CRC and colon polyps, but the combination of IGFBP-2 with other biomarkers such as CEA could increase the sensitivity.

TNF- α — TNF- α may play an important role in the process of carcinogenesis. In addition to its action as a pro-inflammatory cytokine, TNF-α can also lead to tumor development and therefore it can be considered a potential biomarker

ADH — Higher levels of class I ADH isoenzyme are detectable in the serum of patients and are even higher in CRC patients with more advanced stages

CTCs — CTCs may be involved in dissemination and metastatic deposits of CRC and hence their analysis may be useful in monitoring the treatment, and prognostic and predictive drug sensitivity testing.

IL-6 and CRP — CRP and IL-6 concentrations can be used in multimarker panels for CRC diagnosis. CRP and IL-6 concentrations are dramatically increased in patients with lymph node and distant metastases which justifies their potential use as biomarkers for prognosis of CRC

miRNA and lncRNA — miRNA regulates the gene expression through binding to mRNA. Its oncogenic action is the main reason for miRNA to be associated with CRC. lncRNAs affect tumor cells through chromatin interactions.

ADH	Alcohol dehydrogenase
CEA	Carcinoembryonic antigen
CRC	Colorectal cancer
CRP	C-Reactiv Protein
CTCs	Circulating Tumor Cells
CSFs	Colony-stimulating factors
HGFs	Hematopoietic growth factors
IGFBP-2	Insulin-like growth factor binding protein 2
IL-6	Interleukin-6
lncRNA	Long noncoding RNA
M-CSF	Macrophage-colony stimulating factor
miRNA	MicroRNA
TAG-72	Tumor-associated glycoprotein-72
TNF	Tumor necrosis factor

CONSLUSION

The association of HGFs and CTCs with the processes of angiogenesis and metalloproteinases production points to the cinical significance of SCF, IL-3, GM-CSF and M-CSF as potential tumor markers in diagnosis and prognosis of CRC. The benefits of HGF, CTC, and other potential molecular classes of biomarkers, warrant that future research should be directed toward their implementation in CRC diagnosis, clinical outcome prognosis, and treatment monitoring.

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