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Epigenetic and epitranscriptomic changes in colorectal cancer: diagnostic, prognostic, and treatment implications

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Abstract

A cancer cell is the final product of a complex mixture of genetic, epigenetic and epitranscriptomic alterations, whose final interplay contribute to cancer onset and progression. This is specifically true for colorectal cancer, a tumor with a strong epigenetic component, which acts earlier than any other genetic alteration in promoting cancer cell malignant transformation. The pattern of progressive, and usually subtype-specific, DNA and histone modifications that occur in colorectal cancer has been extensively studied in the last decade, providing plenty of data to explore. For this tumor, it became recently evident that also RNA modifications play a relevant role in the activation of oncogenes or repression of tumor suppressor genes. In this review we provide a brief overview of all epigenetic and epitranscriptomic changes that have been found associated to colorectal cancer till now. We explore the impact of these alterations in cancer prognosis and response to treatment and discuss their potential use as cancer biomarkers.