



# Special AT-rich sequence-binding protein 2 (SATB2) expression in colorectal carcinoma; a possible future perspective for targeted therapy

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## Key point

The use of SATB2 (special AT rich sequence binding protein2), immunohistochemical expression in colorectal carcinoma has a well-known value as a sensitive and specific diagnostic marker. Researches in literature are still being done to explore whether it has a prognostic value. The aim of this editorial is to include our insights from the most recently published researches highlighting the role of SATB2 as a cancer stem cell marker for colorectal carcinoma which would open a new scope for trials and researches on SATB2 targeted therapy.

**Keywords:** Colorectal carcinoma, Immunohistochemistry, Prognostic markers, Targeted therapy

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Targeted therapy is limited to patients with stage IV metastatic colorectal cancer (CRC). Many targeted therapies are currently used for the management of advanced CRC including EGFR (epidermal growth factor receptor) and VEGF (vascular endothelial growth factor) inhibitors. Efficacy of EGFR inhibitors is related to the genetic basis of wild type KRAS or NRAS, and BRAF V600E gene mutations. Also immunotherapy with PD-1 inhibitors are used in patients with deficient mismatch repair (dMMR) or microsatellite instability-high (MSI-H) (1).

For the time being trials are held on the value of targeted therapy for Her2, BRAF, NTRK fusions and immunotherapy (2).

Special AT-rich sequence binding protein 2 (SATB2) has been recognized as a highly sensitive and specific diagnostic marker for metastatic CRC especially when combined with CDX2 and CK20. It was recently noted that loss of SATB2 expression more frequently occurs in CRC with dMMR protein deficiency and those with BRAF mutation (3).

The prognostic value of SATB2 has been investigated in CRC and revealed that decreased sensitivity to radiation and chemotherapy were related to decreased SATB2 immunohistochemical expression which was also associated with poor prognosis (4).

IT was proved that decreased SATB2 expression by immunohistochemistry was associated with a worse prognosis, as well as decreased sensitivity to chemotherapy and radiation, for colonic but not rectal carcinoma (4). However, it has not been investigated thoroughly since there is still controversy in the literature about a definite clinical outcome related to SATB2 expression.

SATB2 was recently identified to be a colorectal cancer stem cell marker. It was proved to have a role in malignant transformation of colonic epithelial cells being not expressed in normal cells and highly expressed in cancer cells. Knockdown of SATB2 in colorectal cancer resulted in inhibition of cell proliferation and colony formation, inhibition of epithelial mesenchymal transition, inhibition of stem cell pluripotency, cell survival/ proliferation and finally the B catenin/TCF/LEF pathway (5). All these data highlight to a potential role of SATB2 as a future perspective for targeted therapy.

The use of miR-3666 in colorectal cancer proved to significantly inhibit the proliferation, migration and invasion of CRC cells through directly targeting and suppressing the expression of SATB2 in CRC cells (6).

The aim of this short report is to highlight the role of SATB2 in CRC as a prognostic marker. Being a recently discovered stem cell

marker, it is recommended to be highly investigated as a potential marker for CRC targeted therapy as well.

#### Authors' contribution

Both authors have contributed to the intellectual work, writing, and revising the article before submission. Both authors read and signed the final manuscript.

#### Conflicts of interest

The authors declare no conflicts of interest.

#### Ethical considerations

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