# Role of the chromobox protein CBX7 in carcenogenesis

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**Introduction:** Chromobox Protein Homolog 7 (CBX7) is a 251 amino acid nuclear protein that contains one N-terminal chromo domain and one C-terminal Pc box. Highly expressed in kidney, brain, heart and skeletal muscle, with weaker expression in peripheral blood leukocytes. The CBX7 functions as a component of the chromatin-associated Polycomb complex (PcG) and is involved in maintaining the transcriptionally repressed state of target genes. Additionally, CBX7 modifies chromatin and is thought to extend the cellular life span of epithelial cells by repressing p14 ARF expression, while simultaneously repressing telomerase activity. Due to its ability to repress the transcription of cell-cycle related proteins, CBX7 is thought to play a role in tumorigenesis, specifically in the development of follicular lymphoma and thyroid cancer.

**Objective:** To study on oncogenic activity of CBX7 in humans.

**Methodology:** Expression pattern of CBX7 in a range of normal human tissues and tumor samples was tested to determine oncogenic activity of CBX7.

**Results:** We found in different studies that CBX7 negatively or positively regulates the expression of several genes (SPP1, SPINK1, STEAP1, and FOS, FOSB, EGR1) associated to cancer progression, by interacting with their promoter regions and modulating their transcriptional activity. Furthermore, Cbx7 repressed transcription from the Ink4a/Arf locus and acted epistatically to the Arf-p53 pathway during tumorigenesis. Data identify CBX7 as a chromobox protein causally linked to cancer development and may help to explain the low frequency of INK4a/ARF mutations observed in human follicular lymphoma.

**Discussion:** Mechanism by which the loss of CBX7 expression may contribute to the emergence of a more malignant phenotype and the loss of CBX7 expression might play a critical role in advanced stages of carcinogenesis by deregulating the expression of specific effector genes.