

## **Abstract**

CTCF is a ubiquitously expressed nuclear protein that binds to DNA through its central zinc finger domain. Thousands of CTCF binding sites have been identified throughout the human genome at gene promoters, in intergenic regions or in non-coding sequences. CTCF can function either as a positive or as a negative regulator of gene expression and is also involved in creating and maintaining long-range chromosomal interactions. Various developmentally important genes have been shown to be regulated by CTCF and its malfunction is frequently associated with developmental defects or diseases. CTCF undergoes various posttranslational modifications such as phosphorylation or SUMOylation which also affect its function in the regulation of gene expression.

**Keywords:** CTCF, three dimensional genome, cohesin, regulation of gene expression, insulation, HOX genes