

CTCF

Transcriptional repressor CTCF also known as 11-zinc finger protein or CCCTC-binding factor is a [transcription factor](#) that in humans is encoded by the CTCF gene.

CTCF is involved in many cellular processes, including transcriptional regulation, insulator activity, V(D)J recombination and regulation of chromatin architecture.

[Histone deacetylase 9](#) (HDAC9) has been reported to be elevated in [ischemic brain injury](#), but its mechanism in [stroke](#) is still enigmatic. Shen et al. aimed to unveil the manner of regulation of HDAC9 expression and the effect of HDAC9 activation on neuronal function in [cerebral ischemia](#). [MicroRNAs](#) (MicroRNAs) targeting HDAC9 were predicted utilizing [bioinformatics](#) analysis. They then constructed the [oxygen glucose deprivation](#) cell model and the [middle cerebral artery occlusion rat model](#), and elucidated the expression of CCCTC binding factor ([CTCF](#))/[miR-383-5p](#)/HDAC9. Targeting between miR-383-5p and HDAC9 was verified by [Dual-Luciferase Reporter Assay](#) and [RNAi](#). After conducting an [overexpression/knockdown assay](#), they assessed neuronal impairment and brain injury. They found that CTCF inhibited miR-383-5p expression via its enrichment in the promoter region of [miR-383-5p](#), whereas the miR-383-5p targeted and inhibited HDAC9 expression. In the [oxygen glucose deprivation](#) cell model and the [middle cerebral artery occlusion rat model](#), they confirmed that elevation of HDAC9 regulated by the CTCF/miR-383-5p/HDAC9 pathway mediated [apoptosis](#) induced by endoplasmic reticulum stress, while reduction of HDAC9 alleviated apoptosis and the symptoms of cerebral infarction in MCAO rats. Thus, the CTCF/miR-383-5p/HDAC9 pathway may present a target for drug development against [ischemic brain injury](#) ¹⁾.

¹⁾

Shen J, Han Q, Li W, Chen X, Lu J, Zheng J, Xue S. miR-383-5p Regulated by the Transcription Factor CTCF Affects Neuronal Impairment in Cerebral Ischemia by Mediating Deacetylase HDAC9 Activity. Mol Neurobiol. 2022 Aug 4. doi: 10.1007/s12035-022-02840-4. Epub ahead of print. PMID: 35927544.

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