SMARCE1

The protein encoded by this gene is part of the large ATP-dependent chromatin remodeling complex SWI/SNF, which is required for transcriptional activation of genes normally repressed by chromatin. The encoded protein, either alone or when in the SWI/SNF complex, can bind to 4-way junction DNA, which is thought to mimic the topology of DNA as it enters or exits the nucleosome. The protein contains a DNA-binding HMG domain, but disruption of this domain does not abolish the DNA-binding or nucleosome-displacement activities of the SWI/SNF complex. Unlike most of the SWI/SNF complex proteins, this protein has no yeast counterpart.

Zhang analyzes the expression of SMARCE1 in clear cell meningioma (CCM), and evaluate the role of SMARCE1 in the differential diagnosis in morphologically similar diseases. Methods: Thirteen samples/11 cases of CCMs were collected from the First Affiliated Hospital of Fujian Medical University, Shandong Provincial Hospital, Xuanwu Hospital of Capital Medical University and Thaihe Hospital of Hubei Province from January 2000 to December 2018, as well as 17 cases of meningiomas with clear-cell-like morphology, 782 cases of other types of meningiomas and other intracranial tumors with clear-like morphology. A tissue microarray was made using these cases, on which immunohistochemical/histochemical staining of SMARCE1, SSTR2, EMA, Ki-67, p53, PAS and D-PAS were performed. Result: The tumor cells of CCM had sheet-like architecture, without typical whorl formation. The CCM had round to polygonal cells, with clear, glycogen-rich cytoplasm and prominent blocky perivascular and interstitial collagen. The immunohistochemistry staining showed that none of the CCMs expressed SMARCE1(0/13). However, all of the other types of lesions, including meningioma(782/782), meningiomas with clear-like morphology(17/17), intracranial metastatic clear cell renal cell carcinoma(10/10), haemangioblastoma(10/10), central neurocytoma(10/10), oligodendroglioma(10/10), ependymoma(13/13), glioblastoma(42/42), and solitary fibrous tumor/hemangiopericytoma(35/35) showed positive nuclear staining of SMARCE1. Ki-67 index were 1%-5%, and p53 positive-rate were 0-40% in CCMs. PAS stain showed cytoplasmic granular positive and D-PAS were negative in all CCMs and meningiomas with clear-like morphology. Conclusion: SMARCE1 is a useful marker for the diagnosis of CCM and its mimickers [1].

1)
Zhang L, Yao ZG, Lian F, Wang DZ, Chen YP, Cai SS, Zhang S, Wang XF. [The role of SMARCE1 in the diagnosis of clear cell meningioma]. Zhonghua Bing Li Xue Za Zhi. 2020 Mar 8;49(3):234-238. doi: 10.3760/cma.j.issn.0529-5807.2020.03.005. Chinese. PubMed PMID: 32187894.

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Last update: **2024/06/07 03:00**