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1: [Zhong Nan Da Xue Xue Bao Yi Xue Ban](#). 2007 Aug;32(4):568-73.

[Chemoresistance of CD133(+) tumor stem cells from human brain glioma]

[Article in Chinese]

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OBJECTIVE: To explore the multidrug resistance (MDR) mechanism of ABC superfamily transporters in the tumor stem cells(TSC) from human brain glioma tissues. METHODS: Samples of glioma were obtained from 30 patients undergoing microsurgical tumor resection. The CD133(+) cells and CD133(-) cells from these tumor specimens were isolated by magnetic activated cell sorting(MACS). These cells were cultured, proliferated and passaged. The protein and activity expression of multidrug-resistance protein 1(MDR1) and multidrug-resistance associated protein 1(MRP1) were analyzed between CD133(+) and CD133(-) cells by immunocytochemistry and RT-PCR respectively. RESULTS: CD133(+) cells generated free floating neurospherelike brain tumor spheres(BTS) and abnormal proliferating capacity in the serum-free medium(SFM) in vitro. Three cases from glioblastoma stem cells could form BTS in the complete medium, and could be cultured for 1-3 passages. The range of positive cell proportion for MDR1 and MRP1 expression in CD133(+) cells was 18%-67% and 23%-73% respectively. The expression levels of MDR1 and MRP1 mRNA were higher in CD133(+) glioma stem cells than those in the differentiated tumor cells(TC), the protein activity was increased to 16.1 and 19.6 times respectively compared with that of TC. The protein and activity expression were positively related to the pathological grades of tumors. MDR1 or MRP1 drug resistance was not expressed in all the tumors and there was obvious correlation between MDR1 and MRP1. CONCLUSION: Only a small proportion of cells in the heterogeneous glioma is CD133(+) brain tumor stem cells which display the strong capacity of selfrenewing, abnormal proliferation and intrinsic multidrug resistance to traditional chemotherapy. The high expression of MDR1 and MRP1 by the CD133(+) brain tumor stem cells is one of the main mechanisms in the chemoresistance of tumors. CD133(+) brain tumor stem cells can be served as the root of multidrug resistance and key therapeutic target for glioma chemotherapy.

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