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1: [Zhonghua Yi Xue Za Zhi](#). 2008 Aug 26;88(33):2312-6. [Related Articles,](#)  
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**[Expression of anti-apoptotic and multi-drug resistance-associated protein genes in cancer stem cell isolated from TJ905 glioblastoma multiforme cell line]**

[Article in Chinese]

[Jin F](#), [Li HS](#), [Zhao L](#), [Wei YJ](#), [Zhang H](#), [Guo YJ](#), [Pang R](#), [Jiang XB](#), [Zhao HY](#).

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OBJECTIVE: To isolate cancer stem cells glioblastoma cells and detect the expression of anti-apoptotic and multi-drug resistance-associated protein (MRP) genes thereof. METHODS: CD133 positive cells were isolated from human glioblastoma multiforme cells of the line TJ905 by immunomagnetic beads technique and nestin, beta-tubulin and GFAP expression were examined by Immunofluorescence staining. RT-PCR was used to detect the expression of livin, livinalpha, Livinbeta, Survivin, MRP1, and MRP3. RESULTS: Only 0.21% of the TJ905 cells maintained in serum was CD133(+) and showed characteristics of cancer stem cells, positive in nestin. These cells maintained a sphere-like growth status in serum-free medium in vitro, and could self-renew, proliferate, conditionally differentiate into tubulin-beta(+) and GFAP(+) cells, and produce neurons as well as glial cells. The mRNA expression levels of livin, livinalpha, survivin, MRP1, and MRP3 of the TJ905 tumor stem cells were significantly lower than those of TJ905 cells. CONCLUSION: Cancer stem cells can be isolated from TJ905 glioblastoma multiforme cells. However, the generating rate of the tumor stem cells is lower than that of the TJ905 cells, and the expression levels of anti-apoptotic and MRP genes are lower than those of the progenitor cells. Showing that cancer stem cells are not the solo factor to maintain tumor growth and resist apoptosis and to pump the anti-tumor drugs out of cells.

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