

*Letter to Editor*

How Can Mesenchymal Stem Cells Penetrate the Blood Brain Barrier?

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To the Editor;

We read with keen interest the article "Effects of two types of human cells on outgrowth of human glioma in rats" (1). In this paper, Abdi et al. reported that: Olfactory ensheathing cells (OECs) and bone marrow stem cells (BMSCs) can pass the blood brain barrier (BBB) and reach the glioma mass. Therefore, this approach can be a potentially powerful method for the delivery of therapeutic agents to malignant brain tumors. In addition, these cells can be genetically modified in order to specifically express tumor-inhibiting factors. In terms of how the transplanted cells penetrated the BBB, different groups have taken different views (2,3,5,6,8), but this strategy really provides a new insight into intracranial lesions and tumors in the future, especially intracranial tumors.

We would like to share our ideas on this topic. Methods to more effectively target agents or transplant cells to target tissues and organs are being developed and include the coating of cells with antibodies or peptides, modifying native cell surface molecules, genetic modification, etc. Because of the existence of the BBB, it is difficult to achieve therapeutic effects for intracranial lesions and/or intracranial tumors with conventional treatment (4,7,9). Menge et al. reported that mesenchymal stem cells (MSCs) may be useful for treating a variety of diseases associated with vascular instability and MSCs regulate BBB integrity through tissue inhibitor of matrix metalloproteinase-3 release after traumatic brain injury (7). Park et al. reported that MSCs could stabilize the BBB through regulation of astrocytes (8) and Tang et al. showed that MSCs

maintain and regulate the BBB by inhibiting aquaporin-4 upregulation after cerebral ischemia (9).

We agree with the conclusion of Abdi et al., but we do not know how MSCs or OECs control migration and (or) homing the "Targeted location" and what the mechanisms of MSCs or OECs regarding glioma are. Careful attention to detail in "Trojan horses" would promote the promising therapeutic paradigm for MSC-based or OECs-based therapies for the treatment of intracranial lesions or tumors.

■ ACKNOWLEDGMENT

This work was supported by the National Natural Science Foundation of China (81401295), the Tianjin Research Program of Application Foundation and Advanced Technology (15JC-QNJC45200), the PUMC Youth Fund and the Fundamental Research Funds for the Central Universities (3332015126).

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