Neural stem cells and their role in the pathology and classification of central nervous system tumors.

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Abstract

Today, one of the most popular and controversial topics in medicine is undoubtedly the rapidly developing field of stem cell research. Some of the controversy in this field arises from lack of uniform terminology and different interpretation of concepts such as brain tumor stem cells. In addition, lack of reliable and universal markers that can identify stem cells and define precursor cells in a particular differentiation pathway further confounds the interpretation of results in many studies. Stem cells are undoubtedly critical in normal cellular development as well as tumor biology and better characterization of these cells is likely to have profound influence on the classification schemes of tumors. In this manuscript, we present the generally accepted definitions of key concepts in stem cell biology and review some of the related molecular pathways. In addition, we put forth our position on how progress in this field should be affecting the future classification schemes of central nervous system neoplasia. We strongly believe that the ever increasing knowledge in the field of neural and brain tumor stem cells should be influential in the subsequent attempts to classify brain tumors.

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