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(doi:10.1517/14712598.7.8.1129)**Brain tumour stem cells: possibilities of new therapeutic strategies**Sara GM Piccirillo & Angelo L Vescovi<sup>†</sup> PhDUniversity of Milan, Department of Biotechnology and Biosciences, Bicocca & Stemgen, SPA, Milan, Italy +39 02 6448 3351; +39 02 7004 31033; [vescovi@tin.it](mailto:vescovi@tin.it)<sup>†</sup> Author for correspondence

Cancers are composed of heterogeneous cell populations, including highly proliferative immature precursors and differentiated cells, which may belong to different lineages. Recent advances in stem cell research have demonstrated the existence of tumour-initiating, cancer stem cells (CSCs) in non-solid and solid tumours. These cells are defined as CSCs because they show functional properties that resemble those of their normal counterpart to a significant extent. This concept applies to CSCs from brain tumours and, particularly, to glioblastoma stem-like cells, which self-renew under clonal conditions and differentiate into neuron- and glia-like cells, and into aberrant cells, with mixed neuronal/astroglia phenotypes. Notably, across serial transplantation into immunodeficient mice, glioblastoma stem-like cells are able to form secondary tumours which are a phenocopy of the human disease. A significant effort is underway to identify both CSC-specific markers and the molecular mechanism that underpin the tumorigenic potential of these cells, for this will have a critical impact on the understanding of the origin of malignant brain tumour and the discovery of new and more specific therapeutic approaches. Lately, the authors have shown that some of the bone morphogenetic proteins can reduce the tumorigenic ability of CSCs in GBMs. This suggests that mechanisms regulating the physiology of normal brain stem cells may be still in place in their cancerous siblings and that this may lead to the development of cures that selectively target the population CSCs found in the patients' tumour mass.

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