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Alternative models of cancer stem cells: The stemness phenotype model, 10 years later

The stemness phenotype model

Abstract

The classical cancer stem cell theory proposed the existence of a rare but constant subpopulation of cancer stem cells (CSCs). In this model cancer cells are organized hierarchically and are responsible for tumor resistance and tumor relapse. Thus, eliminating CSCs will eventually lead to cure of cancer. This simplistic model has been challenged by experimental data. In 2010 we proposed a novel and controversial alternative model of cancer stem cell biology (the Stemness Phenotype Model, SPM)

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The Stemness Phenotype Model

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Opposite to the classical cancer stem cell model, we introduced the stemness phenotype model (SPM), which proposed that all glioma cells possess stem cell properties and that the stemness is modulated by the microenvironment. A key prediction of the SPM is that to cure gliomas all gliomas cells (CSCs and non-CSCs) should be eliminated at once.

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(PDF) The Stemness Phenotype Model

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The stemness phenotype model proposes that all **cancer cells** have **stem cell** properties and that **the stemness** of individual **cell** depends on the microenvironment. (a) **Cell** division mode.

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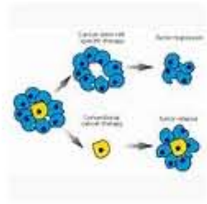
Cancer Stem Cell



Cancer stem cells (CSCs) are cancer cells (found within tumors or hematological cancers) that possess characteristics associated with normal stem cells, specifically the ability to give rise to all cell types found in a particular cancer sample. CSCs are therefore tumorigenic (tumor-forming), perhaps in contrast to other non-tumorigenic cancer cells. CSCs may generate tumors through the stem cell processes of self-renewal and differentiation into multiple cell types. Such cells are hypothesized to persist in tumors as a distinct population and cause relapse and metastasis by giving rise to new tumors. Therefore, development of specific therapies targeted at CSCs holds hope for improvement of survival and quality of life of cancer patients, especially for patients with metastatic disease.

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