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# Cancer Stem Cells

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## Introduction

Most cancers still remain not curable with the currently available therapeutic approaches, despite how much we have learnt about cancer biology in the last decades. Current treatments are based on the assumption that cancer is a proliferation-based disease. Accordingly, the main treatments are antiproliferative and they are non-specific and with serious side-effects. Furthermore, although cytotoxic drugs reduce tumour burden, relapse occurs in the majority of the cases. This paradox, that early treatment response is not related with late survival, can be explained by recent data suggesting that many malignancies arise from a rare population of cells that are the only ones that retain the ability to self-renew and sustain the tumour. These are the “Cancer Stem Cells”, CSCs. In some cases, these CSCs are considered to be close derivatives of normal tissue stem cells. Another possibility is that a small portion of cancer cells has adopted the properties of a stem cell. In either situation, the net result will be the same, in that CSCs are the cells responsible for replenishing the tumour mass. They are resistant to conventional treatments because, being stem cells, they divide infrequently. Thus, gaining insight into the biology of these CSCs will allow designing targeted agents to prevent their longevity to interfere with our own one. However, mouse model systems tailored to exploit this new concept of tumour biology are not yet available. They will be, nevertheless, critical to provide the basis for the development of novel CSC-based anti-cancer therapies and new methods for assessing treatment efficacy.

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## Selected Links

- “Cancer Stem Cells”. In Encyclopaedia of Life Sciences
- "Cancer Stem Cell". In Wikipedia

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This article is part of the Cancer Center's News Archive, and is listed here for historical purposes. The information and links may no longer be up- to-date.
[http://www.cancer.med.umich.edu/news/stemcell.htm]

**2.** ScienceDaily: Sick Kids Researchers Confirm That Cancer Stem Cells Initiate And Grow Brain Tumours
*Apr 2007*
Researchers at The Hospital for Sick Children (Sick Kids) and the University of Toronto (U of T) have confirmed that childhood and adult brain tumours originate from cancer stem cells and that these stem cells fuel and maintain...
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**3.** Researchers have identified stem cells in brain cancer tumors that replenish the tumors and keep them growing.
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Journal of Huazhong University of Science and Technology - Medical Science pp.675-677 Cited 0 times.

**2.** Transitions between epithelial and mesenchymal states in development and disease
(2008) Baum, B. | Settleman, J. | Quinlan, M.P.
Seminars in Cell and Developmental Biology pp.294-308 Cited 0 times.

**3.** Effects of adjuvant chemotherapy on bone marrow mesenchymal stem cells of colorectal cancer patients
(2008) Cao, J. | Tan, M.H. | Yang, P. | Li, W.L. | Xia, J. | Du, H. | Tang, W.B. | Wang, H. | Chen, X.W. | Xiao, H.Q.
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**3.** Cancer stem cells created with technique developed at Stanford
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