Clarifying the effect of stem cell therapy on cancer

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Injection of human stem cells into mice with tumors slowed down tumor growth, finds research published in BioMed Central's open access journal *Stem Cell Research & Therapy*. Human mesenchymal stem cells (MSC), isolated from bone marrow, caused changes in blood vessels supplying the tumor, and it is this modification of blood supply which seems to impact tumor growth.

The use of stem cells in treating cancer has been controversial, with some studies finding that stem cells force tumors to enter programmed cell death. However other studies find that stem cells actually promote tumor growth by inducing infiltration of new blood vessels. In attempting to sort out this puzzle researchers from INSERM groups at Université Joseph Fourier in collaboration with CHU de Grenoble investigated the impact of MSC on already established subcutaneous or lung metastasis in mice.

For both the subcutaneous and lung tumors, injection of MSC reduced cell division, consequently slowing the rate of tumor growth. Part of the mode of action of stem cells therefore appears to be due to with angiogenesis, but the mechanism behind this is still unclear.

Claire Rome who led this study explained, "We found that MSC altered vasculature inside the tumor - although new blood vessels were generated, overall they were longer and fewer than in untreated tumors. This could be restricting the oxygen and nutrients to the tumor, limiting cell division." She continued, "Our study confirms others which propose

that stem cells, in particular MSC, might be one way forwards in treating cancer."

Commenting on this study Celia Gomes, from the University of Coimbra, said, "One of the interesting questions this study raises is when MSC promote tumor growth and when they restrict it. The answer seems to be timing – this study looks at already established tumors, while others, which find that MSC increase growth, tend to be investigating new tumors. This is a first step in the path to identifying exactly which patients might benefit from stem cell therapy and who will not."

More information: The dual effect of MSCs on tumour growth and tumour angiogenesis, Michelle Kéramidas, Florence de Fraipont, Anastassia Karageorgis, Anaïck Moisan, Virginie Persoons, Marie-Jeanne Richard, Jean-Luc Coll and Claire Rome, *Stem Cell Research & Therapy* 2013, 4:41

Commentary: The dual role of mesenchymal stem cells in tumor progression, Célia MF Gomes, *Stem Cell Research & Therapy* 2013, 4:42

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