

Screening for transformed human mesenchymal stromal cells with tumorigenic potential

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Researchers at Erasmus University Medical Center Rotterdam, The Netherlands, led by Dr. Qiuwei Pan and Dr. Luc van der Laan, have discovered that spontaneous tumorigenic transformation of human mesenchymal stem/stromal cells (MSCs) can occur during cell culture expansion, although the frequency is relatively low and often only observed after extensive passage in culture. This report appears in the January 2014 issue of *Experimental Biology and Medicine*.

Currently, MSCs are being widely investigated as a potential treatment for various diseases. According to ClinicalTrials.gov, over 350 clinical trials using MSCs have been registered by the end of 2013 (with a search of: [mesenchymal stem cells](#)). For cell transplantation, MSCs are often isolated from either the patient or from a third party donor, and then expanded in cell culture before therapeutic application. In fact, spontaneous transformation of primary cells in cell culture has been well-investigated over decades. Malignant transformation of murine and monkey MSCs has also recently been reported.

The current study confirmed that spontaneous tumorigenic transformation of human MSCs can occur during cell culture expansion. This potentially has large implications for the clinical application of ex vivo expanded MSCs. "Although this transformation is rare, we do need to carefully examine the presence of these aberrant cells in MSC cultures, before transplanting into patients", stresses the first author Dr.

Pan. "We now have identified RNA molecule signatures that can be applied as a potential biomarker for the detection of these dangerous cells in long-term cultures", said senior author Dr. van der Laan. "However, further research is required to validate this biomarker in clinical grade cultures of MSCs that are used in clinical trials".

Dr. Steven R. Goodman, Editor-in-Chief of *Experimental Biology and Medicine* said "This study provides a possible method for testing the safety of expanded [adult stem cells](#). We look forward to the validation of these RNA biomarkers".

Provided by Society for Experimental Biology and Medicine

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