

## Stem cell mobilization therapy may effectively treat osteoarthritis

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Researchers in Taiwan have found that peripheral blood stem cells can be "mobilized" by injection of a special preparation of granulocyte colony-stimulating factor (G-CSF) into rats that modeled osteoarthritis (OA). The bone marrow was stimulated to produce stem cells, leading to the inhibition of OA progression. The finding, they said, may lead to a more effective therapy for OA, a common joint disease that affects 10 percent of Americans over the age of 60.

The study will be published in a future issue of *Cell Transplantation* and is currently freely available on-line as an unedited early [e-pub](#).

"Currently, OA treatment involves the use of anti-inflammatory drugs, analgesics, lubricating supplements, or surgery," said study lead author Dr. Shih-Chieh Hung of the Department of Medical Research and Education at the Taipei Veterans general Hospital in Taiwan. "Recently, hematopoietic (blood) [stem cells](#) derived from [bone marrow](#) have emerged as a potential treatment for OA. We hypothesized that G-CSF-mobilized peripheral [blood stem cells](#) (gm-PBSCs) contain a population of primitive stem cells that have the capacity for mobility once released from stem cell niches."

While the beneficial effects of G-CSF-mobilized peripheral blood stem cells have been documented when used for treating the negative effects of chemotherapy and radiation, as well as peripheral arterial diseases, this is the first study to investigate the use of gm-PBSCs to treat skeletal diseases, such as OA.

"We demonstrated that PBSCs, mobilized by G-CSF and infused for five days in rats modelling OA, provided a number of beneficial results, including increasing cluster of differentiation 34 positive (CD34+) cell percentages up to 55 fold," reported the authors. "Further, we demonstrated that the progression of OA was inhibited by the gm-PBSCs."

The researchers noted that the use of G-CSF administration in humans to treat other diseases and conditions has been found to be "safe and effective," despite known side effects such as bone pain, headache, fatigue, and nausea which, they added, are generally "transient, self-limiting and without long-term consequences."

"Although potential long-term adverse effects, such as malignancy after G-CSF administration have been reported, the frequency is low and the relationship between major adverse effects and G-CSF administration is not clear," said Dr. Hung.

The researchers concluded that injection with G-CSF-mobilized [peripheral blood stem cells](#) may offer "a convenient protocol for treating OA with consistent beneficial results."

"This study provides further evidence that the use of G-CSF to mobilize stem cells from the bone marrow has potential benefit for a myriad of different disorders, in this case OA." said Dr. Shinn-Zong Lin, professor of Neurosurgery and superintendent at the China Medical University Hospital, Beigang, Taiwan and Coeditor-in-chief of *Cell Transplantation*. "Further studies are required to determine whether this approach is likely to be effective in humans, but it is promising."

**More information:** Deng, M-W.; Wei, S-J.; Yew, T-L.; Lee, P-H.; Yang, T-Y.; Chu, H-Yi.; Hung, S-C. Cell therapy with G-CSF-mobilized stem cells in a rat osteoarthritis model. *Cell Transplant*. Appeared or

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