

Team pioneers cancer treatment that targets bone metastases while sparing bone

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University of California, Irvine researchers have developed and tested on mice a therapeutic treatment that uses engineered stem cells to target and kill cancer bone metastases while preserving the bone.

This new approach, reported in the journal *EBioMedicine*, equips engineered mesenchymal [stem cells](#) with targeting agents that drive them to bone metastatic sites, where they offload therapeutics.

"What's powerful about this strategy is that we deliver a combination of both anti-tumor and anti-bone resorption agents so we can effectively block the vicious circle between cancers and their bone niche," said the study's lead author, Weian Zhao, associate professor of pharmaceutical sciences and biomedical engineering. "This is a safe and almost nontoxic treatment compared to chemotherapy, which often leaves patients with lifelong issues."

Sandra Spivey, an Orange County patient advocate who has been living with metastatic breast cancer since 1997, has experienced firsthand the ravages of traditional treatment. "Chemotherapy can kill both [cancer cells](#) and normal cells and create drastic side effects," she said. "I have lost my hair; I have lost sensation in my hands and feet. Most of all, chemotherapy really robs you of your time. This new targeted approach could improve quality of life both during and after treatment."

The strategy could also be implemented with other bone diseases that are usually difficult to manage, such as multiple myeloma and osteoporosis.

"This study will pave the way to a clinical trial in the short term, as this type of stem cell has already been tested and deemed safe in the clinic," Zhao said. "UCI's Department of Pharmaceutical Sciences, Sue & Bill Gross Stem Cell Research Center and Chao Family Comprehensive Cancer Center are fully equipped to conduct this type of clinical trial. We will look to target patients with bone metastases."

More information: Aude I. Segaliny et al, Combinatorial targeting of cancer bone metastasis using mRNA engineered stem cells, *EBioMedicine* (2019). [DOI: 10.1016/j.ebiom.2019.06.047](https://doi.org/10.1016/j.ebiom.2019.06.047)

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