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## Drug delivery with nanoparticles to improve osteosarcoma outcomes

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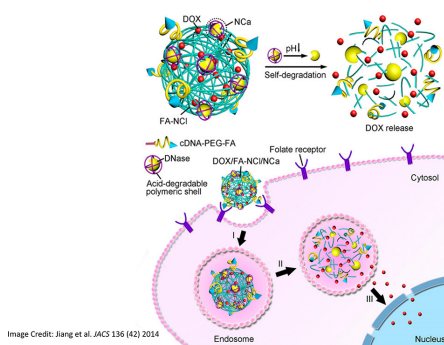
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This type of bone cancer has comparatively low survival rates that could be raised with targeted drug delivery.



Osteosarcoma is a type of bone cancer that primarily affects children and young adults. It is known for its aggressive malignancy and has very low survival rates compared with most other pediatric cancers. Treatment improved in the later half of the 20th century with the introduction of neoadjuvant chemotherapy but has since stalled.

Chen et al. explored recent advances in the use of nanoparticles for targeted drug delivery and their applications toward osteosarcoma treatment. They discussed promising types of nanoparticles and directions for future research.

“Improvements to neoadjuvant chemotherapy are urgently needed,” said author Wei Guo. “New technologies such as nanomaterials, which give new ways of delivering and releasing chemotherapeutic drugs, have been shown to not only enhance the therapeutic effect but also greatly reduce the side effects associated with chemotherapy.”

The ideal carrier needs to be stable in the body, nontoxic, and biodegradable, while preferentially targeting cancer cells. The authors covered several promising delivery mechanisms with these characteristics, such as liposomes, protein-based nanoparticles, exosomes, and carbon-based nanocarriers. They also described methods of targeting tumors and delivering drugs.

The team concludes by discussing directions for future research. They summarize challenges facing the field, such as developing safer and more effective carriers, identifying the most suitable delivery method for each patient and cancer type, and selecting the best drug or drug combination to complement existing therapies.

“Most importantly, the development of carriers that target osteosarcoma lung metastases and rarely affect the lung tissues would be a breakthrough in the research of osteosarcoma treatment bottlenecks,” said Guo.

**Source:** “Nanosized drug delivery strategies in osteosarcoma chemotherapy,” by Chenglong Chen, Shidong Wang, Juan Wang, Fang-Zhou Yao, Xiaodong Tang, and Wei Guo, *APL Bioengineering* (2023). The article can be accessed at <https://doi.org/10.1063/5.0137026>.

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