

Engineered Exosome-based Drug Delivery System for Synergistic Cancer Therapy

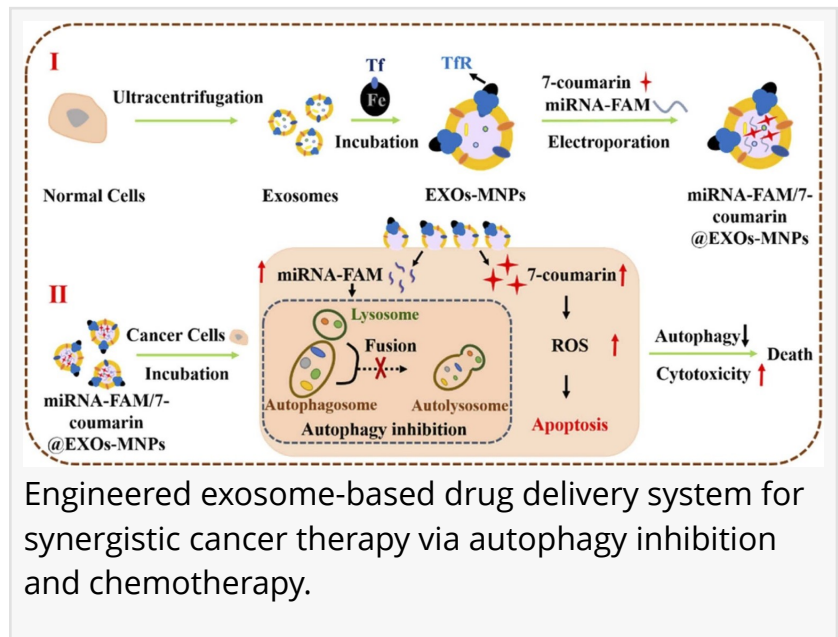
USA, August 16, 2024

/EINPresswire.com/ -- The researchers developed an exosome-based drug delivery system which employed synergistic miRNA-based autophagy inhibition and 7-coumarin-based chemotherapy for [ovarian cancer](#) therapy.

Ovarian cancer is one of the most common malignancies in women worldwide. Unlike breast cancer, ovarian cancer lacks early diagnostic markers and does not show noticeable symptoms until cancer metastases, leading to a low survival rate for ovarian cancer patients. Traditional cancer treatments include surgery, radiation therapy, chemotherapy and interventional therapy. However, the distribution of chemotherapeutic drugs in vivo is non-specific and often toxic to healthy cells, leading to unsatisfactory efficacy.

In a study (<https://doi.org/10.1016/j.bioana.2024.05.002>) published in the KeAi journal Biomedical Analysis, a group of researchers from China outline a new discrimination and treatment approach — a novel exosome-based drug delivery system that could improve the cell entry ability of drugs and the targeting of cancer cells. This approach provides a new drug delivery system and synergistic therapy idea, paving the way for future clinical applications.

"Exosomes are extracellular vesicles with lipid bilayers that have been extensively used as delivery vehicles for multiple drugs due to their high biocompatibility, low immunogenicity, the abilities to cross various biological barriers and evade the clearance by immune system," explains the study's corresponding author Songqin Liu, a professor at the Jiangsu Engineering Laboratory of Smart Carbon-Rich Materials and Device at Southeast University. "The synergistic cancer treatment by loading various nucleic acids and drugs into exosomes utilizes the advantages of different therapeutic approaches and has been applied to effectively treat cancers through the synergy of different treatment mechanisms."



Engineered exosome-based drug delivery system for synergistic cancer therapy via autophagy inhibition and chemotherapy.

Autophagy is an intracellular degradative process where a cell engulfs its own cytoplasmic proteins or organelles and encapsulates them into autophagosomes. Many studies have shown that in cancer biology, autophagy plays a dual role in tumor promotion and inhibition. Notably, inhibition of autophagy shows potential in improving the clinical treatment of cancer patients.

"We constructed a novel antitumor exosome-based drug delivery system employing the synergistic effects of miRNA-regulated autophagy inhibition and coumarin anticancer drugs to achieve effective treatment of ovarian cancer," says Xin Hua, first author of the study. "With the anti-tumor effects and intracellular visualization from 7-coumarin, the regulation of the autophagy process from encapsulated miRNA, the targeting of cancer cells from exosome, the synergistic effect and exosome-based drug delivery strategy for anti-cancer therapy showed promising prospects for in vitro and clinical applications."

DOI

10.1016/j.bioana.2024.05.002

Original Source URL

<https://doi.org/10.1016/j.bioana.2024.05.002>

Funding information

This project was supported by the ZhiShan Scholar Program of Southeast University (2242022R40053).

Lucy Wang

BioDesign Research

[email us here](#)

This press release can be viewed online at: <https://www.einpresswire.com/article/736080686>

EIN Presswire's priority is source transparency. We do not allow opaque clients, and our editors try to be careful about weeding out false and misleading content. As a user, if you see something we have missed, please do bring it to our attention. Your help is welcome. EIN Presswire, Everyone's Internet News Presswire™, tries to define some of the boundaries that are reasonable in today's world. Please see our Editorial Guidelines for more information.

© 1995-2024 Newsmatics Inc. All Right Reserved.