International Journal of Nanomedicine

Dovepress
Taylor & Francis Group

Open Access Full Text Article

LETTER

Key Magnetized Exosomes for Effective Targeted Delivery of Doxorubicin Against Breast Cancer Cell Types in Mice Model [Letter]

Hanzhe Zhao[1], Mingzheng Hu[2]

[1]China Three Gorges University, College of Basic Medical Sciences, Yichang, Hubei, People's Republic of China; [2]Department of Hepatobiliary Surgery, Yichang Central People's Hospital, Yichang, Hubei, People's Republic of China

Correspondence: Mingzheng Hu, Yichang Central People's Hospital, No. 183 Yiling Avenue, Wujia District, Yichang, Hubei, People's Republic of China, Email humingzheng@ctgu.edu.cn

Dear editor

We appreciate the opportunity to read and comment on the article "Key Magnetized Exosomes for Effective Targeted Delivery of Doxorubicin Against Breast Cancer" by Wei Xu, Keren Wang et al.[1] This study presents an innovative magnetized exosome drug delivery system, offering a promising avenue for breast cancer treatment. While the findings are encouraging, several aspects warrant further discussion to enhance the study's scientific rigor and translational potential.

First, the study employs ultracentrifugation combined with reagent-based extraction to isolate exosomes. Although this approach is widely used, previous studies have pointed out its potential limitations in preserving exosome structural integrity and functionality.[2] Since exosome quality directly impacts drug delivery efficacy, incorporating comparative analyses of alternative isolation methods in future research could provide valuable insights, particularly for clinical scalability.

Second, while the study highlights the targeting potential of Fe3O4 nanoparticles, the long-term biodistribution and toxicity of these nanoparticles remain underexplored. Given prior research emphasizing risks associated with nanoparticle accumulation,[3] comprehensive in vivo studies examining chronic toxicity, clearance rates, and immune responses are crucial for advancing this technology towards clinical use.

Third, the study briefly mentions the use of an external magnetic field in guiding drug delivery. However, the effects of magnetic field strength and frequency on delivery efficiency are not explored in detail. Optimizing these parameters through systematic investigation could significantly enhance the targeting precision and therapeutic outcomes of magnetized exosome systems, as suggested by prior work.[4]

In conclusion, this study offers valuable insights into the potential of magnetized exosome-based drug delivery systems for breast cancer treatment. While the findings are encouraging, addressing the concerns highlighted above could further strengthen the study's impact and accelerate its clinical translation. We commend the authors for their innovative approach and look forward to seeing future advancements in this area.

Disclosure

The authors declare no conflicts of interest in this communication.

References

1. Xu W, Wang K, Wang K, Zhao Y, Yang Z, Li X. Key magnetized exosomes for effective targeted delivery of doxorubicin against breast cancer cell types in mice model. *Int J Nanomed*. 2024;19:10711–10724. doi:10.2147/IJN.S479306
2. Zhang Y, Bi J, Huang J, Tang Y, Du S, Li P. Exosome: A review of its classification, isolation techniques, storage, diagnostic and targeted therapy applications. *Int J Nanomed*. 2020;15:6917–6934. doi:10.2147/IJN.S264498

Received: 23 December 2024
Accepted: 13 January 2025
Published: 16 January 2025

3. Haque S, Whittaker MR, McIntosh MP, Pouton CW, Kaminskas LM. Disposition and safety of inhaled biodegradable nanomedicines: Opportunities and challenges. *Nanomedicine*. 2016;12(6):1703–1724. doi:10.1016/j.nano.2016.03.002
4. Wahajuddin W. Superparamagnetic iron oxide nanoparticles: magnetic nanoplatforms as drug carriers. *Int J Nanomed*. 2012;7:3445–3471. doi:10.2147/IJN.S30320

https://doi.org/10.2147/IJN.S513867